# THE GOULD'S BELT DISTANCES SURVEY (GOBELINS). IV. DISTANCE AND DEPTH OF THE TAURUS STAR-FORMING REGION

Phillip A. B. Galli,<sup>1</sup> Laurent Loinard,<sup>2,3</sup> Gisela N. Ortiz-Léon,<sup>3</sup> Marina A. Kounkel,<sup>4</sup> and Sergio A. Dzib<sup>3</sup>

<sup>1</sup>Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, Rua do Matão, 1226, Cidade Universitária, 05508-900, São Paulo - SP, Brazil

<sup>2</sup> Instituto de Radioastronomía y Astrofísica, Universidad Nacional Autónoma de México, Morelia 58089, México

<sup>3</sup>Max Planck Institut für Radioastronomie, Auf dem Hügel 69, D-53121, Bonn, Germany

<sup>4</sup>Department of Astronomy, University of Michigan, 500 Church Street, Ann Arbor, MI 48105, USA

(Received July 1, 2016; Revised September 27, 2016; Accepted July 21, 2017)

Submitted to ApJ

# ABSTRACT

text text text

Keywords: text — text — text

## 1. INTRODUCTION

## - define acronyms: YSOs, VLBI, GOBELINS

### 2. SAMPLE AND OBSERVATIONS

In a recent study, Dzib et al. (2015) reported on multiepoch radio observations of the Taurus-Auriga starforming complex using the Karl G. Jansky Very Large Array (VLA). They detected 59 sources related to YSOs, 18 field stars and another 46 unidentified sources whose radio properties are consistent with YSOs. However, only 56% of the young stars identified in their study exhibit properties compatible with non-thermal radio emission that can be detected with VLBI observations. These sources constitute the starting point of our sample for the GOBELINS project in the Taurus region.

The observations presented in this paper were obtained with the Very Long Baseline Array (VLBA) near the equinoxes of every year between 2012 August and 2017 April. The data were recorded in dual polarization mode with a bandwidth of 256 MHz centered at  $\nu = 5.0$ or 8.4 GHz (C- and X-bands, respectively). We observed with the X-band ( $\nu = 8.4 \text{ GHz}$ ) during the first 3 years of our observing program, and then switched to the C-band  $(\nu = 5.0 \text{ GHz})$  which reduced significantly the noise in our observations. The VLBA was pointed at the position of our targets that have been accommodated in 54 different fields. Table 1 lists the observed epochs, bands, pointing positions and calibrators for each field. In some of these fields two or more targets are observed simultaneously. We included additional phase centers within the primary beam to observe other sources reported by Dzib et al. (2015) independently of their nature (YSO candidates, field stars or extragalactic sources) as part of our observing strategy (see Ortiz-León et al. 2017, for more details). Doing so, we observed a total of 87 sources (or stellar systems) during our observing campaign of which 45 are known YSOs in the literature. As shown in Fig. 1 our targets are spread over the various molecular clouds of the Taurus star-forming region.

Our observations produced a number of 153 different projects under the code BL175 (see Table 1). Each observing session consisted of cycles alternating between the target(s) and the main phase calibrator. The secondary calibrators were observed every  $\sim$ 50 minutes. In addition, we also observed blocks of geodetic calibrators over a wide range of elevations at the beginning and end of each session. The typical integration time in each cycle was  $\sim$ 2 minutes for science targets and  $\sim$ 1 minute for calibrators. The total integration time for projects that observed with the X-band and C-band were, respectively, 1.1 hours and 1.5 hours. The calibrators used in our observations are extragalactic sources and the positions of all sources in each project are referenced to the corresponding primary calibrator.

The data were edited and calibrated using the Astronomical Image Processing System (AIPS, Greisen 2003) following the standard prescription for VLBA data as described in Ortiz-León et al. (2017). We applied the same calibration to all sources in the field when multiple targets were observed in the same session. The calibrated visibilities were imaged with a pixel size of 50-100  $\mu as$  and resulted in a typical angular resolution of 3 mas × 1 mas at  $\nu = 5.0$  GHz and 2 mas × 0.8 mas at  $\nu = 8.4$  GHz. The mean noise level in the calibrated images were 26  $\mu$ Jy/beam and 42  $\mu$ Jy/beam, respectively, at the C- and X-bands. Finally, the source position (and the corresponding errors) were obtained from a two-dimensional Gaussian fitting using the JMFIT task.

As mentioned before, we observed a total of 87 targets in Taurus for the GOBELINS project, but only 53 sources could be detected in our observations. Table 2 lists the sources that have been observed in our campaign with the VLBA. We provide the minimum and maximum flux density measured at both frequencies, the brightness temperature  $T_B$ , the number of detections and observations for each source. In some cases we provide an upper flux density limit of  $3\sigma$  (based on the noise level of the image) when the source was observed but could not be detected. For binaries and multiple systems that could be resolved in our observations we present the results for each component separately. We note that all sources in Table 2 exhibit a brightness temperature of  $T_B > 10^6$  K which is consistent with non-thermal radio emission. The remaining 34 sources in our initial target list emit only thermal radiation, thus they could not be detected with the VLBA. We consider a single detection to be valid when the flux density of the source is above a  $5\sigma$  threshold where  $\sigma$  is the corresponding noise level of the image. Our effective sample of detected sources contains 26 stars that have been confirmed as YSOs in previous studies, and another 4 sources that require further monitoring to investigate their membership in the Taurus region. The remaining 23 sources that have been detected in our observations are likely to be background contaminants that are not related to the Taurus molecular clouds. As shown in Fig. 2 their position change rate is consistent with zero while the typical proper motion of YSOs in Taurus is about 22 mas/yr (see e.g. Bertout & Genova 2006).

Some sources in our sample had been observed with the VLBA in the past. Thus, we searched the National Radio Astronomy Observatory's (NRAO) data archive for additional information on our targets. We collected a total of 59 projects at different epochs that are listed



Figure 1. Location of our targets in the Taurus star-forming complex overlaid on the extinction map from Dobashi et al. (2005). The most prominent Lynds dark clouds (Lynds 1962) in this region are identified in this diagram.



Figure 2. Histogram of the position change rate for all sources observed in our campaign with a minimum of two detections with the VLBA.

in Table 3. These observations were performed between 2004 March and 2007 December which allows us to extend the time base of our analysis to more than 10 years of observations for some targets. This is particularly useful to investigate the orbital motion of binaries and multiple systems in our sample as discussed in the forthcoming sections of this paper. Although the source positions obtained from these observations have already been published in previous studies, we decided to download and re-calibrate these data using the same procedure that was adopted for the GOBELINS project to better combine both data sets. The typical noise level and angular resolution that we obtain in the recalibrated images from archival data are, respectively, 100  $\mu$ Jy/beam and 2 mas  $\times$  0.8 mas.

### 3. ASTROMETRY FITTING

## 3.1. Single Stars

The displacement of a single star in the plane of the sky is the combination of its proper motion  $(\mu_{\alpha}, \mu_{\delta})$  and the trigonometric parallax  $(\pi)$ . The stellar coordinates as a function of time (t) are given by

$$\alpha(t) = \alpha_0 + (\mu_\alpha \cos \delta)t + \pi f_\alpha(t), \qquad (1)$$

$$\delta(t) = \delta_0 + \mu_\delta t + \pi f_\delta(t), \qquad (2)$$

where  $(\alpha_0, \delta_0)$  are the coordinates of the star at a given epoch  $(t_0)$ . The projections of the parallactic ellipse  $(f_\alpha, f_\delta)$  are given by (see e.g. Seidelmann 1992)

$$f_{\alpha} = (X \sin \alpha - Y \cos \alpha) / \cos \delta , \qquad (3)$$

$$f_{\delta} = X \cos \alpha \sin \delta + Y \sin \alpha \sin \delta - Z \cos \delta, \qquad (4)$$

where (X, Y, Z) are the barycentric coordinates of the Earth (in units of A.U.) computed from the planetary ephemerides DE405 using the **novas** package in Python.

## 3.2. Binaries

Binaries and multiple systems are very common in Taurus (Duchêne 1999) and they are also present in our sample. Since both stars in a binary system move around their common centre of gravity, their orbital motion projected onto the plane of the sky has to be taken into account to accurately determine the parallaxes and proper motions of the individual components.

At this stage it is important to distinguish between (i) binaries with orbital periods much longer than the monitoring time of our observing campaign, and (ii) binaries with short or intermediate periods where our observations cover a significant fraction of the orbital period. In the first case, it is possible to assume an uniform acceleration (see e.g. Loinard et al. 2007) leading to

$$\alpha(t) = \alpha_0 + (\mu_\alpha \cos \delta)t + \frac{1}{2}(a_\alpha \cos \delta)t^2 + \pi f_\alpha(t) , \quad (5)$$

$$\delta(t) = \delta_0 + \mu_\delta t + \frac{1}{2}a_\delta t^2 + \pi f_\delta(t), \qquad (6)$$

where  $a_{\alpha}$  and  $a_{\delta}$  are the acceleration terms. In the second case, the effects of the binary motion and the existence of a non-uniform acceleration need to be taken into account. It is therefore necessary to fit for the full orbital motion and the astrometric parameters simultaneously. The orbital elements to be considered in this case are the semi-major axis a, the orbital period P, the eccentricity e, the epoch of periastron passage  $T_p$ , the argument of the ascending node  $\Omega$ , the longitude of the periastron  $\omega$  and the inclination i of the orbital plane. Thus, the equations for the primary component of the system with semi-major axis  $a_1$  can be written in the form

$$\alpha(t) = \alpha_0 + (\mu_\alpha \cos \delta)t + \pi f_\alpha(t) + a_1 Q_\alpha(t), \qquad (7)$$

$$\delta(t) = \delta_0 + \mu_\delta t + \pi f_\delta(t) + a_1 Q_\delta(t) , \qquad (8)$$

where  $Q_{\alpha}$  and  $Q_{\delta}$  are the orbital factors. They are given by (see e.g. van de Kamp 1967)

$$Q_{\alpha} = B'x(t) + G'y(t), \qquad (9)$$

$$Q_{\delta} = A'x(t) + F'y(t), \qquad (10)$$

where the orientation factors B', A', G', F' are related to the Thiele-Innes constants as follows

$$B' = -\cos\omega\sin\Omega - \sin\omega\cos\Omega\cos i, \qquad (11)$$

 $A' = -\cos\omega\cos\Omega + \sin\omega\sin\Omega\cos i\,,\qquad(12)$ 

$$G' = +\sin\omega\sin\Omega - \cos\omega\cos\Omega\cos i, \qquad (13)$$

$$F' = +\sin\omega\cos\Omega + \cos\omega\sin\Omega\cos i. \qquad (14)$$

The elliptical rectangular coordinates x(t) and y(t) are given by

$$x(t) = \cos E(t) - e, \qquad (15)$$

$$y(t) = \sin E(t)\sqrt{1 - e^2},$$
 (16)

where E(t) is the eccentric anomaly given by Kepler's transcendental equation. Similar equations hold for the secondary component. In this case, we replace  $a_1$  by the semi-major axis  $a_2$  of the secondary which is scaled by the mass ratio q of the two components.

#### 3.3. Solving the system of equations

The source positions obtained from the JMFIT task in AIPS were used to derive the astrometric and orbital parameters of the stars in our sample. However, it is important to mention that the positional uncertainties provided by JMFIT, which roughly represent the expected astrometric precision delivered by the VLBA, do not include the various systematic errors that may significantly affect the accuracy of the computed astrometric parameters (see e.g. Pradel et al. 2006). To overcome this problem, additional errors were added quadratically to the positional errors given by JMFIT to adjust the reduced  $\chi^2$  value in the astrometric fit to unity (see also Menten et al. 2007; Ortiz-León et al. 2017).

To solve for the astrometric and orbital elements of the star (or stellar system) we developed our own routine in Python programming language based on the emcee package (Foreman-Mackey et al. 2013) which implements the Markov chain Monte Carlo (MCMC) method proposed by Goodman & Weare (2010). The algorithm was adapted to our purposes and applied to the general problem of computing the astrometric and orbital parameters from the astrometry fitting. Briefly, the method that we use in this work explores the parameter space using a number of walkers and iteration steps to solve the system of equations presented in Sects. 3.1 and 3.2 via Bayesian inference. The walkers move around the n-dimensional parameter space<sup>1</sup> and take tentative steps towards the lowest value of  $\chi^2$ . Our result for each parameter is obtained from the distribution of the individual solutions given by the ensemble of walkers. We run the MCMC method with a high number of walkers (typically, 1000 walkers) to sample the distribution of each parameter with a significant number of individual solutions. Then, we take the mean and standard deviation of the distribution of each parameter as our final solution.

Our methodology based on the MCMC method was first applied to the sources previously investigated by our team in the Ophiuchus region (Ortiz-León et al. 2017) for calibration purposes. We varied the number of iterations for each walker from 1 to 500 steps, and verified that convergence of the Markov-chains of the ensemble of walkers is attained after 200 iterations steps where the mean (and median) of the computed parameters are clearly bounded by the variance of the sample. Thus, the solutions based on the MCMC method presented in this paper are calculated with 1000 walkers and 200 iteration steps. RESULTS
 DISCUSSION

 $<sup>^1</sup>$  The value of n depends on the system of equations that is being solved (see Sects. 3.1 and 3.2).

## GALLI ET AL.

 $\label{eq:table 1. Conserved fields in Taurus with the VLBA.$ 

Project Code	Date	Band	$\alpha$	δ	Calibrators
			(h:m:s)	(°′′′)	
BL175C1	20-aug-2012	Х	04 22 02.20	19 33 27.0	J0412+1856, J0428+1732, J0426+2327, J0412+2305
BL175C2	30-aug-2012	Х	$04 \ 31 \ 25.13$	$18\ 16\ 16.6$	J0431+1731, J0428+1732, J0438+2153, J0440+1437
BL175C3	31-aug-2012	Х	$04 \ 31 \ 40.09$	$18 \ 13 \ 56.7$	$J0431\!+\!1731,J0428\!+\!1732,J0438\!+\!2153,J0440\!+\!1437$
BL175C4	10-sep- $2012$	Х	$04 \ 32 \ 14.58$	$18\ 20\ 14.6$	J0431+1731, J0428+1732, J0438+2153, J0440+1437
BL175C5	30-sep- $2012$	Х	$04 \ 31 \ 34.15$	$18\ 08\ 04.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
			$04 \ 32 \ 29.47$	$18 \ 14 \ 00.3$	
BL175C6	30-nov-2012	Х	$04 \ 33 \ 26.35$	$22 \ 28 \ 32.0$	$J0438{+}2153,J0450{+}2249,J0426{+}2350,J0431{+}1731$
BL175C7	02-dec- $2012$	Х	$04 \ 35 \ 13.27$	$22 \ 59 \ 20.0$	${\tt J0438+2153, \ J0426+2327, \ J0435+2532, \ J0450+2249}$
BL175C8	03-dec- $2012$	Х	$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	${\rm J}0438{+}2153,{\rm J}0426{+}2327,{\rm J}0435{+}2532,{\rm J}0450{+}2249$
BL175C9	04-dec- $2012$	Х	$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	$J0438 + 2153, \ J0426 + 2327, \ J0435 + 2532, \ J0450 + 2249$
BL175CA	$07\text{-} ext{dec-}2012$	Х	$04 \ 35 \ 58.97$	$22 \ 38 \ 35.2$	${\rm J}0438{+}2153,{\rm J}0426{+}2327,{\rm J}0435{+}2532,{\rm J}0450{+}2249$
BL175CG	23-mar-2013	Х	$04 \ 22 \ 02.20$	$19\ 33\ 27.0$	$J0412\!+\!1856,J0428\!+\!1732,J0426\!+\!2327,J0412\!+\!2305$
BL175CH	25-mar-2013	Х	$04 \ 31 \ 25.13$	$18\ 16\ 16.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
BL175CI	11-apr-2013	Х	$04 \ 31 \ 40.09$	$18\ 13\ 56.7$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
BL175CJ	22-apr-2013	Х	$04 \ 32 \ 14.58$	$18\ 20\ 14.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
BL175CK	28-apr-2013	Х	$04 \ 31 \ 34.15$	$18\ 08\ 04.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
			$04 \ 32 \ 29.47$	$18 \ 14 \ 00.3$	
BL175CL	30-apr-2013	Х	$04 \ 33 \ 26.35$	$22 \ 28 \ 32.0$	J0438+2153, J0450+2249, J0426+2350, J0431+1731
BL175CM	21-may-2013	Х	$04 \ 35 \ 13.27$	$22 \ 59 \ 20.0$	${\rm J}0438{+}2153,{\rm J}0426{+}2327,{\rm J}0435{+}2532,{\rm J}0450{+}2249$
BL175CN	23-may-2013	Х	$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	J0438+2153, J0426+2327, J0435+2532, J0450+2249
BL175CO	24-may-2013	Х	$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	${\rm J}0438{+}2153,{\rm J}0426{+}2327,{\rm J}0435{+}2532,{\rm J}0450{+}2249$
BL175CP	27-may-2013	Х	$04 \ 35 \ 58.97$	$22 \ 38 \ 35.2$	J0438+2153, J0426+2327, J0435+2532, J0450+2249
BL175D0	30-may-2013	Х	$04 \ 41 \ 23.47$	$24 \ 55 \ 28.1$	J0438+2153, J0435+2532, J0440+2728, J0450+2249
BL175CV	10-jun-2013	Х	$04 \ 32 \ 37.91$	$24\ 20\ 54.4$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
BL175D1	11-jun-2013	Х	$04 \ 41 \ 44.92$	$25 \ 58 \ 15.3$	${\rm J}0438{+}2153,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
BL175CW	15-jun-2013	Х	$04 \ 33 \ 06.63$	$24\ 09\ 54.9$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
BL175CX	16-jun-2013	Х	$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
BL175CY	01-jul-2013	Х	$04 \ 36 \ 57.44$	$24 \ 18 \ 35.2$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
BL175CZ	04-jul-2013	Х	$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	${\rm J}0435{+}2532,{\rm J}0429{+}2724,{\rm J}0438{+}2153,{\rm J}0426{+}2327$
BL175D2	14-jul-2013	Х	$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
BL175Z0	01-aug-2013	Х	$04 \ 42 \ 10.59$	$25\ 25\ 05.5$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
BL175D4	19-aug-2013	Х	$04 \ 42 \ 46.20$	$25\ 18\ 06.2$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
BL175D5	03-sep- $2013$	Х	$04 \ 43 \ 08.05$	$25\ 22\ 10.3$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
BL175D6	16-sep-2013	Х	$04 \ 24 \ 48.59$	$26\ 43\ 13.0$	J0429+2724,J0435+2532,J0433+2905,J0426+2350

 $Table \ 1 \ continued$ 

=

Project Code	Date	Band	$\alpha$	δ	Calibrators
			(h:m:s)	(°′′′)	
BL175D7	25-sep-2013	Х	04 25 17.48	$26\ 17\ 48.3$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
BL175D8	22-oct-2013	Х	$04 \ 29 \ 20.74$	$26 \ 33 \ 53.4$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
BL175D9	23-oct-2013	Х	$04 \ 29 \ 22.26$	$26 \ 37 \ 28.6$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
BL175DA	26-oct-2013	Х	$04 \ 29 \ 29.49$	$26 \ 31 \ 52.8$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
BL175DB	27-oct-2013	Х	$04 \ 29 \ 42.48$	$26 \ 32 \ 48.9$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
BL175DC	28-oct-2013	Х	04  30  02.25	$26\ 08\ 43.5$	${\rm J0429+2724,\ J0435+2532,\ J0433+2905,\ J0426+2350}$
BL175DD	29-oct-2013	Х	$04 \ 31 \ 14.45$	$27 \ 10 \ 17.6$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0433{+}2905,{\rm J}0426{+}2350$
BL175DE	30-oct-2013	Х	$04 \ 31 \ 48.73$	$25 \ 40 \ 21.8$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0433{+}2905,{\rm J}0426{+}2350$
BL175DF	06-nov-2013	Х	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	${\rm J0408+3032,\;J0429+2724,\;J0359+2758,\;J0422+3058}$
BL175DG	08-nov-2013	Х	$04 \ 18 \ 30.10$	$28\ 26\ 47.3$	${\tt J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DH	10-nov-2013	Х	$04 \ 18 \ 33.37$	$28 \ 37 \ 32.2$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DI	17-nov-2013	Х	$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DK	30-nov-2013	Х	$04 \ 19 \ 16.12$	$27 \ 50 \ 48.2$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DJ	01-dec- $2013$	Х	$04 \ 18 \ 47.03$	$28\ 20\ 07.2$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DL	04-dec- $2013$	Х	$04 \ 19 \ 26.27$	$28\ 26\ 14.0$	J0429+2724,J0422+3058,J0408+3032,J0403+2600
BL175DM	07-dec-2013	Х	$04 \ 19 \ 41.28$	$27\ 49\ 47.9$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
BL175DN	08-dec- $2013$	Х	$04 \ 22 \ 02.20$	$26\ 57\ 30.3$	$J0429{+}2724,J0422{+}3058,J0408{+}3032,J0403{+}2600$
BL175DO	10-dec- $2013$	Х	$04 \ 13 \ 27.23$	$28 \ 16 \ 24.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
BL175DP	13-dec- $2013$	Х	$04 \ 13 \ 43.75$	$28\ 20\ 55.9$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
BL175DQ	06-jan-2014	Х	$04 \ 14 \ 12.93$	$28 \ 12 \ 11.9$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
BL175DR	07-jan-2014	Х	$04 \ 14 \ 48.00$	$27 \ 52 \ 34.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
BL175DS	27-jan-2014	Х	$04 \ 16 \ 28.11$	$28\ 07\ 35.4$	J0429+2724, J0408+3032, J0422+3058, J0403+2600
BL175DT	28-jan-2014	Х	$04 \ 18 \ 25.42$	$25\ 21\ 56.4$	$J0412+2305,\ J0426+2327,\ J0429+2724,\ J0403+2600$
BL175DU	30-jan-2014	Х	$04 \ 55 \ 34.45$	$30\ 28\ 08.4$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
BL175DV	31-jan-2014	Х	$04 \ 55 \ 36.97$	$30\ 17\ 54.8$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
BL175DW	08-feb- $2014$	Х	$04 \ 56 \ 07.08$	$30\ 27\ 26.7$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
BL175H0	02-apr-2014	Х	04 29 22.26	$26 \ 37 \ 28.6$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 29 \ 29.49$	$26 \ 31 \ 52.8$	
			04 29 42.48	$26 \ 32 \ 48.9$	
BL175H1	04-apr-2014	Х	$04 \ 30 \ 02.25$	$26 \ 08 \ 43.5$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 31 \ 14.45$	$27 \ 10 \ 17.6$	
			$04 \ 31 \ 48.73$	$25 \ 40 \ 21.8$	
BL175H2	06-apr-2014	Х	04 18 30.10	28 26 47.3	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			04 18 33.37	28 37 32.2	
			$04 \ 18 \ 40.62$	28 19 15.3	
BL175H3	07-apr-2014	Х	$04 \ 18 \ 47.03$	$28\ 20\ 07.2$	J0429+2724, J0422+3058, J0408+3032, J0403+2600

Table 1 continued

\_

Galli et al.

Table 1 (continued)

Project Code	Date	Band	α	δ	Calibrators
			(h:m:s)	(°′′′)	
			04 19 16.12	27 50 48.2	
			$04 \ 19 \ 26.27$	28 26 14.0	
BL175H4	08-apr-2014	Х	04 19 41.28	27 49 47.9	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 22 \ 02.20$	$26 \ 57 \ 30.3$	
			04 16 28.11	$28\ 07\ 35.4$	
BL175H5	10-apr-2014	Х	$04 \ 13 \ 27.23$	28 16 24.4	J0408+3032, J0359+2758, J0403+2600, J0422+3058
			$04 \ 13 \ 43.75$	$28 \ 20 \ 55.9$	
			$04 \ 14 \ 12.93$	28 12 11.9	
BL175H6	11-apr-2014	Х	$04 \ 55 \ 34.45$	$30\ 28\ 08.4$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
			$04 \ 55 \ 36.97$	$30\ 17\ 54.8$	
			$04 \ 56 \ 07.08$	$30\ 27\ 26.7$	
BL175H7	12-apr-2014	Х	$04 \ 22 \ 02.20$	$19 \ 33 \ 27.0$	$J0412\!+\!1856,J0428\!+\!1732,J0426\!+\!2327,J0412\!+\!2305$
BL175H8	13-apr-2014	Х	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	$J0408 + 3032, \ J0429 + 2724, \ J0359 + 2758, \ J0422 + 3058$
BL175H9	17-apr-2014	Х	$04 \ 31 \ 34.15$	$18\ 08\ 04.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
			$04 \ 32 \ 29.47$	$18 \ 14 \ 00.3$	
BL175HA	18-apr-2014	Х	$04 \ 14 \ 48.00$	$27 \ 52 \ 34.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04 \ 18 \ 25.42$	$25\ 21\ 56.4$	J0412+2305, J0426+2327, J0429+2724
BL175AD	31-aug-2014	Х	$04 \ 32 \ 37.91$	$24\ 20\ 54.4$	$J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153$
			$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175EU	07-sep-2014	Х	$04 \ 22 \ 02.20$	$19 \ 33 \ 27.0$	$J0412 + 1856, \ J0428 + 1732, \ J0426 + 2327, \ J0412 + 2305$
BL175AB	08-sep-2014	Х	$04 \ 31 \ 25.13$	$18\ 16\ 16.6$	J0431+1731, J0428+1732, J0438+2153, J0440+1437
			$04 \ 31 \ 40.09$	$18 \ 13 \ 56.7$	
			$04 \ 32 \ 14.58$	$18\ 20\ 14.6$	
BL175AC	09-sep- $2014$	Х	$04 \ 35 \ 13.27$	22 59 20.0	J0438+2153, J0426+2327, J0435+2532, J0450+2249
			$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	
			$04 \ 35 \ 48.11$	22 53 29.1	
BL175CQ	13-sep- $2014$	Х	$04 \ 15 \ 15.92$	29 12 44.6	J0408+3032, J0429+2724, J0359+2758, J0422+3058
BL175AE	14-sep- $2014$	Х	$04 \ 41 \ 23.47$	$24 \ 55 \ 28.1$	J0438+2153, J0426+2327, J0435+2532, J0450+2249
			$04 \ 41 \ 44.92$	25 58 15.3	
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175AF	15-sep-2014	Х	$04 \ 42 \ 10.59$	$25 \ 25 \ 05.5$	J0429+2724, J0435+2532, J0440+2728, J0450+2249
			$04 \ 42 \ 46.20$	$25 \ 18 \ 06.2$	
			04 43 08.05	$25 \ 22 \ 10.3$	
BL175AG	19-sep- $2014$	Х	04 24 48.59	26 43 13.0	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 25 \ 17.48$	$26\ 17\ 48.3$	

Project Code	Date	Band	$\alpha$	δ	Calibrators
			(h:m:s)	(°′′′)	
			04 29 20.74	26 33 53.4	
BL175AH	20-sep-2014	Х	$04 \ 29 \ 22.26$	$26 \ 37 \ 28.6$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 29 \ 29.49$	$26 \ 31 \ 52.8$	
			$04 \ 29 \ 42.48$	$26 \ 32 \ 48.9$	
BL175AJ	22-oct-2014	Х	$04 \ 18 \ 30.10$	$28 \ 26 \ 47.3$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 18 \ 33.37$	$28 \ 37 \ 32.2$	
			$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	
BL175AI	24-oct-2014	Х	04  30  02.25	$26\ 08\ 43.5$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0433{+}2905,{\rm J}0426{+}2350$
			$04 \ 31 \ 14.45$	$27 \ 10 \ 17.6$	
			$04 \ 31 \ 48.73$	$25 \ 40 \ 21.8$	
BL175AK	25-oct-2014	Х	$04 \ 18 \ 47.03$	$28\ 20\ 07.2$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
			$04 \ 19 \ 16.12$	$27 \ 50 \ 48.2$	
			$04 \ 19 \ 26.27$	$28\ 26\ 14.0$	
BL175AL	20-mar-2015	Х	$04 \ 31 \ 25.13$	$18 \ 16 \ 16.6$	${\tt J0431+1731,\ J0428+1732,\ J0438+2153,\ J0440+1437}$
			$04 \ 31 \ 40.09$	$18\ 13\ 56.7$	
			$04 \ 32 \ 14.58$	$18\ 20\ 14.6$	
BL175AM	21-mar- $2015$	Х	$04 \ 35 \ 13.27$	$22 \ 59 \ 20.0$	$J0438 + 2153, \ J0426 + 2327, \ J0435 + 2532, \ J0450 + 2249$
			$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	
			$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	
BL175AN	23-mar-2015	Х	$04 \ 32 \ 37.91$	$24 \ 20 \ 54.4$	J0426+2327, J0435+2532, J0429+2724, J0438+2153
			$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175AO	28-mar-2015	Х	$04 \ 41 \ 23.47$	$24 \ 55 \ 28.1$	J0438+2153, J0435+2532, J0440+2728, J0450+2249
			$04 \ 41 \ 44.92$	25 58 15.3	
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175AP	29-mar-2015	Х	$04 \ 42 \ 10.59$	$25 \ 25 \ 05.5$	J0429+2724, J0435+2532, J0440+2728, J0450+2249
			$04 \ 42 \ 46.20$	$25 \ 18 \ 06.2$	
			$04 \ 43 \ 08.05$	$25 \ 22 \ 10.3$	
BL175AY	30-mar-2015	Х	$04 \ 24 \ 48.59$	26 43 13.0	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 25 \ 17.48$	$26\ 17\ 48.3$	
			$04 \ 29 \ 20.74$	$26 \ 33 \ 53.4$	
BL175AZ	02-apr-2015	Х	04 29 22.26	26 37 28.6	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			04 29 29.49	26 31 52.8	
			04 29 42.48	$26 \ 32 \ 48.9$	
BL175DZ	07-apr-2015	Х	04 18 47.03	28 20 07.2	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 19 \ 16.12$	$27 \ 50 \ 48.2$	

Galli et al.

Table 1 (continued)

Project Code	Date	Band	α	δ	Calibrators
			(h:m:s)	(°′′′)	
			04 19 26.27	28 26 14.0	
BL175E6	09-apr-2015	Х	04 19 41.28	$27 \ 49 \ 47.9$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			04 22 02.20	26 57 30.3	
			04 16 28.11	$28\ 07\ 35.4$	
BL175E8	10-apr-2015	Х	04 13 27.23	28 16 24.4	J0408+3032, J0359+2758, J0403+2600, J0422+3058
			$04 \ 13 \ 43.75$	$28 \ 20 \ 55.9$	
			$04 \ 14 \ 12.93$	28 12 11.9	
BL175E9	13-apr-2015	Х	$04 \ 55 \ 34.45$	$30\ 28\ 08.4$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
			$04 \ 55 \ 36.97$	$30\ 17\ 54.8$	
			$04 \ 56 \ 07.08$	$30\ 27\ 26.7$	
BL175EA	14-apr-2015	Х	$04 \ 31 \ 34.15$	$18 \ 08 \ 04.6$	J0431+1731, J0428+1732, J0438+2153, J0440+1437
			$04 \ 32 \ 29.47$	$18 \ 14 \ 00.3$	
BL175FN	17-apr-2015	Х	$04 \ 18 \ 30.10$	$28\ 26\ 47.3$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 18 \ 33.37$	$28 \ 37 \ 32.2$	
			$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	
BL175EC	19-apr-2015	Х	$04 \ 14 \ 48.00$	$27 \ 52 \ 34.4$	J0408+3032, J0359+2758, J0403+2600, J0422+3058
			$04 \ 18 \ 25.42$	$25\ 21\ 56.4$	J0412+2305, J0426+2327, J0429+2724
BL175ED	20-apr- $2015$	Х	$04 \ 36 \ 57.44$	$24 \ 18 \ 35.2$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
			$04 \ 35 \ 58.97$	$22 \ 38 \ 35.2$	
			04  50  51.95	$22\ 49\ 05.9$	
BL175FO	24-apr-2015	Х	$04 \ 33 \ 26.35$	$22 \ 28 \ 32.0$	$J0438{+}2153,J0450{+}2249,J0426{+}2350,J0431{+}1731$
			$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	J0435+2532, J0429+2724, J0426+2327
BL175EV	25-apr- $2015$	Х	$04 \ 22 \ 02.20$	$19 \ 33 \ 27.0$	$J0412\!+\!1856,J0428\!+\!1732,J0426\!+\!2327,J0412\!+\!2305$
BL175EW	26-apr-2015	Х	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	$J0408 + 3032, \ J0429 + 2724, \ J0359 + 2758, \ J0422 + 3058$
BL175GZ	04-sep- $2015$	Х	$04 \ 31 \ 25.13$	$18\ 16\ 16.6$	J0431+1731,J0428+1732,J0438+2153,J0440+1437
			$04 \ 31 \ 40.09$	$18\ 13\ 56.7$	
			$04 \ 32 \ 14.58$	$18\ 20\ 14.6$	
BL175HC	11-sep- $2015$	Х	$04 \ 32 \ 37.91$	$24\ 20\ 54.4$	$J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153$
			$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175HD	12-sep- $2015$	Х	$04 \ 41 \ 23.47$	$24 \ 55 \ 28.1$	J0438 + 2153,  J0435 + 2532,  J0440 + 2728,  J0450 + 2249
			$04 \ 41 \ 44.92$	$25 \ 58 \ 15.3$	
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175HE	18-sep- $2015$	Х	$04 \ 42 \ 10.59$	$25 \ 25 \ 05.5$	${\tt J0429+2724,J0435+2532,J0440+2728,J0450+2249}$
			$04 \ 42 \ 46.20$	$25 \ 18 \ 06.2$	
			$04 \ 43 \ 08.05$	$25 \ 22 \ 10.3$	

Table 1 $($	(continued)
-------------	-------------

Project Code	Date	Band	α	δ	Calibrators
			(h:m:s)	(°′′′)	
BL175HF	20-sep-2015	Х	04 24 48.59	26 43 13.0	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 25 \ 17.48$	$26\ 17\ 48.3$	
			$04 \ 29 \ 20.74$	$26 \ 33 \ 53.4$	
BL175HB	16-oct-2015	Х	$04 \ 35 \ 13.27$	22 59 20.0	J0438+2153, J0426+2327, J0435+2532, J0450+2249
			$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	
			$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	
BL175HG	27-sep-2015	Х	$04 \ 29 \ 22.26$	$26\ 37\ 28.6$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 29 \ 29.49$	$26 \ 31 \ 52.8$	
			$04 \ 29 \ 42.48$	$26 \ 32 \ 48.9$	
BL175HH	29-sep-2015	Х	$04 \ 30 \ 02.25$	$26\ 08\ 43.5$	${\rm J}0429{+}2724,{\rm J}0435{+}2532,{\rm J}0433{+}2905,{\rm J}0426{+}2350$
			$04 \ 31 \ 14.45$	$27\ 10\ 17.6$	
			$04 \ 31 \ 48.73$	$25 \ 40 \ 21.8$	
BL175HJ	03-oct-2015	Х	$04 \ 18 \ 47.03$	$28\ 20\ 07.2$	${\rm J}0429{+}2724,{\rm J}0422{+}3058,{\rm J}0408{+}3032,{\rm J}0403{+}2600$
			$04 \ 19 \ 16.12$	$27 \ 50 \ 48.2$	
			$04 \ 19 \ 26.27$	$28\ 26\ 14.0$	
BL175HK	04-oct-2015	Х	$04 \ 19 \ 41.28$	$27\ 49\ 47.9$	$J0429{+}2724,J0422{+}3058,J0408{+}3032,J0403{+}2600$
			$04 \ 22 \ 02.20$	$26 \ 57 \ 30.3$	
			$04 \ 16 \ 28.11$	$28\ 07\ 35.4$	
BL175HM	06-oct-2015	Х	$04 \ 55 \ 34.45$	$30\ 28\ 08.4$	${\tt J0459+3106,\ J0503+3403,\ J0512+2927,\ J0439+3045}$
			$04 \ 55 \ 36.97$	$30\ 17\ 54.8$	
			$04 \ 56 \ 07.08$	$30\ 27\ 26.7$	
BL175HI	08-oct-2015	Х	$04 \ 18 \ 30.10$	$28\ 26\ 47.3$	${\rm J0429+2724,\ J0422+3058,\ J0408+3032,\ J0403+2600}$
			$04 \ 18 \ 33.37$	$28 \ 37 \ 32.2$	
			$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	
BL175HL	09-oct-2015	Х	$04 \ 13 \ 27.23$	$28\ 16\ 24.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04 \ 13 \ 43.75$	$28\ 20\ 55.9$	
			$04 \ 14 \ 12.93$	$28 \ 12 \ 11.9$	
BL175HN	11-oct-2015	Х	$04 \ 31 \ 34.15$	$18\ 08\ 04.6$	$J0431\!+\!1731,J0428\!+\!1732,J0438\!+\!2153,J0440\!+\!1437$
			$04 \ 32 \ 29.47$	$18 \ 14 \ 00.3$	
BL175HO	12-oct-2015	Х	$04 \ 14 \ 48.00$	$27 \ 52 \ 34.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04 \ 18 \ 25.42$	$25\ 21\ 56.4$	J0412+2305, J0426+2327, J0429+2724
BL175HP	13-oct- $2015$	Х	$04 \ 36 \ 57.44$	$24 \ 18 \ 35.2$	$J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153$
			$04 \ 35 \ 58.97$	$22 \ 38 \ 35.2$	
			$04 \ 50 \ 51.95$	$22 \ 49 \ 05.9$	
BL175HQ	15-oct-2015	Х	$04 \ 33 \ 26.35$	$22 \ 28 \ 32.0$	J0438+2153, J0450+2249, J0426+2350, J0431+1731
			$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	J0435+2532, J0429+2724, J0426+2327

Galli et al.

Table 1 (continued)

Project Code	Date	Band	$\alpha$	$\delta$	Calibrators
			(h:m:s)	(°′′′)	
BL175HR	17-oct-2015	Х	04 22 02.20	19 33 27.0	J0412+1856, J0428+1732, J0426+2327, J0412+2305
BL175HS	20-oct-2015	Х	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	J0408+3032, J0429+2724, J0359+2758, J0422+3058
BL175I1	28-feb-2016	С	$04 \ 24 \ 48.59$	$26\ 43\ 13.0$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 25 \ 17.48$	$26\ 17\ 48.3$	
BL175I2	18-mar-2016	С	$04 \ 35 \ 13.27$	22 59 20.0	J0438+2153, J0426+2327, J0435+2532, J0450+2249
			$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	
			$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	
BL175I3	24-mar-2016	$\mathbf{C}$	$04 \ 18 \ 30.10$	$28\ 26\ 47.3$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 18 \ 33.37$	$28 \ 37 \ 32.2$	
			$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	
BL175I4	25-mar-2016	С	$04 \ 32 \ 37.91$	$24\ 20\ 54.4$	${\tt J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153}$
			$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175I5	26-mar-2016	$\mathbf{C}$	$04 \ 14 \ 48.00$	$27 \ 52 \ 34.4$	J0408+3032, J0359+2758, J0403+2600, J0422+3058
			$04 \ 18 \ 25.42$	$25\ 21\ 56.4$	J0412+2305, J0426+2327, J0429+2724
BL175I6	31-mar-2016	С	$04 \ 19 \ 41.28$	$27 \ 49 \ 47.9$	$J0429 {+} 2724, J0422 {+} 3058, J0408 {+} 3032, J0403 {+} 2600$
			$04 \ 22 \ 02.20$	$26\ 57\ 30.3$	
			$04 \ 16 \ 28.11$	$28\ 07\ 35.4$	
BL175I7	03-apr-2016	С	$04 \ 29 \ 26.75$	$26 \ 30 \ 47.8$	${\rm J0429+2724,\ J0435+2532,\ J0433+2905,\ J0426+2350}$
			$04 \ 42 \ 10.59$	$25\ 25\ 05.5$	
BL175I8	04-apr-2016	С	$04 \ 22 \ 02.20$	$19\ 33\ 27.0$	J0412 + 1856,  J0428 + 1732,  J0426 + 2327,  J0412 + 2305
BL175I9	07-apr-2016	$\mathbf{C}$	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	$J0408 + 3032, \ J0429 + 2724, \ J0359 + 2758, \ J0422 + 3058$
BL175IC	14-apr-2016	$\mathbf{C}$	$04 \ 41 \ 44.92$	$25\ 58\ 15.3$	${\rm J}0438{+}2153,{\rm J}0435{+}2532,{\rm J}0440{+}2728,{\rm J}0450{+}2249$
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175IE	29-apr-2016	$\mathbf{C}$	$04 \ 13 \ 27.23$	$28 \ 16 \ 24.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04 \ 14 \ 12.93$	$28 \ 12 \ 11.9$	
BL175IF	01-may-2016	$\mathbf{C}$	$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	$J0435+2532,\ J0429+2724,\ J0438+2153,\ J0426+2327$
			$04 \ 31 \ 40.09$	$18\ 13\ 56.7$	J0431+1731, J0428+1732, J0440+1437
BL175IU	03-sep-2016	С	$04 \ 13 \ 27.23$	$28 \ 16 \ 24.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04 \ 14 \ 12.93$	$28 \ 12 \ 11.9$	
BL175IX	08-sep- $2016$	С	$04 \ 35 \ 13.27$	$22 \ 59 \ 20.0$	$J0438 + 2153, \ J0426 + 2327, \ J0435 + 2532, \ J0450 + 2249$
			$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	
			$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	
BL175IV	14-sep- $2016$	$\mathbf{C}$	$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	${\tt J0435+2532,\ J0429+2724,\ J0438+2153,\ J0426+2327}$
			$04 \ 31 \ 40.09$	$18 \ 13 \ 56.7$	J0431+1731, J0428+1732, J0440+1437
BL175IY	22-sep-2016	С	$04 \ 19 \ 41.28$	$27 \ 49 \ 47.9$	J0429+2724, J0422+3058, J0408+3032, J0403+2600

Table 1 continued

\_

Project Code	Date	Band	α	δ	Calibrators
			(h:m:s)	(° ′ ′′)	
			04 22 02.20	26 57 30.3	
			$04 \ 16 \ 28.11$	$28 \ 07 \ 35.4$	
BL175J2	23-sep-2016	С	04 18 30.10	$28 \ 26 \ 47.3$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 18 \ 40.62$	28 19 15.3	
BL175J3	25-sep-2016	С	$04 \ 24 \ 48.59$	$26\ 43\ 13.0$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 29 \ 22.26$	$26 \ 37 \ 28.6$	
BL175J4	29-sep-2016	С	$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	J0426+2327, J0435+2532, J0429+2724, J0438+2153
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175IW	08-oct-2016	$\mathbf{C}$	$04 \ 41 \ 44.92$	$25 \ 58 \ 15.3$	$J0438 + 2153, \ J0435 + 2532, \ J0440 + 2728, \ J0450 + 2249$
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175J0	10-oct-2016	С	$04 \ 22 \ 02.20$	$19 \ 33 \ 27.0$	$J0412 {+} 1856, J0428 {+} 1732, J0426 {+} 2327, J0412 {+} 2305$
BL175J1	11-oct-2016	С	$04 \ 15 \ 15.92$	$29\ 12\ 44.6$	$J0408 + 3032, \ J0429 + 2724, \ J0359 + 2758, \ J0422 + 3058$
BL175IZ	13-oct-2016	$\mathbf{C}$	$04 \ 29 \ 26.75$	$26 \ 30 \ 47.8$	${\rm J0429+2724,\ J0435+2532,\ J0433+2905,\ J0426+2350}$
			$04 \ 42 \ 10.59$	$25 \ 25 \ 05.5$	
BL175J5	14-oct-2016	$\mathbf{C}$	$04 \ 14 \ 48.00$	$27\ 52\ 34.4$	$J0408 + 3032, \ J0359 + 2758, \ J0403 + 2600, \ J0422 + 3058$
			$04\ 55\ 36.97$	$30\ 17\ 54.8$	${\tt J0459+3106,\ J0503+3403,\ J0512+2927,\ J0439+3045}$
BL175JU	05-mar- $2017$	С	$04 \ 33 \ 06.63$	$24 \ 09 \ 54.9$	$J0426+2327,\ J0435+2532,\ J0429+2724,\ J0438+2153$
			$04 \ 33 \ 10.04$	$24 \ 33 \ 43.1$	
BL175JO	10-mar-2017	С	$04 \ 13 \ 27.23$	$28 \ 16 \ 24.4$	$J0408 + 3032,\ J0359 + 2758,\ J0403 + 2600,\ J0422 + 3058$
			$04 \ 14 \ 12.93$	$28 \ 12 \ 11.9$	
BL175JW	14-mar-2017	$\mathbf{C}$	$04 \ 35 \ 20.91$	$22 \ 54 \ 24.0$	J0438+2153, J0435+2532, J0440+2728, J0450+2249
			$04 \ 42 \ 06.41$	$25 \ 22 \ 59.5$	
BL175JQ	15-mar-2017	$\mathbf{C}$	$04 \ 16 \ 28.11$	$28\ 07\ 35.4$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 19 \ 41.28$	$27 \ 49 \ 47.9$	
BL175JS	18-mar-2017	$\mathbf{C}$	04 18 30.10	$28 \ 26 \ 47.3$	J0429+2724, J0422+3058, J0408+3032, J0403+2600
			$04 \ 18 \ 40.62$	$28 \ 19 \ 15.3$	
BL175JP	26-mar-2017	$\mathbf{C}$	$04 \ 34 \ 39.24$	$25 \ 01 \ 00.8$	J0435+2532, J0429+2724, J0438+2153, J0426+2327
			$04 \ 31 \ 40.09$	$18 \ 13 \ 56.7$	J0431+1731, J0428+1732, J0440+1437
BL175JV	11-apr-2017	С	04 14 48.00	27 52 34.4	J0408+3032, J0359+2758, J0403+2600, J0422+3058
			$04 \ 55 \ 36.97$	$30\ 17\ 54.8$	J0459+3106, J0503+3403, J0512+2927, J0439+3045
BL175JT	13-apr-2017	С	$04 \ 24 \ 48.59$	$26 \ 43 \ 13.0$	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			04 29 22.26	26 37 28.6	
BL175JY	14-apr-2017	С	04 29 42.48	26 32 48.9	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			04 42 10.59	$25 \ 25 \ 05.5$	
BL175JZ	21-apr-2017	С	04 24 49.03	26 43 10.1	J0429+2724, J0435+2532, J0433+2905, J0426+2350
			$04 \ 31 \ 13.00$	$27 \ 08 \ 34.9$	

14					Galli et	AL.
				Ta	able 1 (conti	inued)
	Project Code	Date	Band	α	δ	Calibrators
				(h:m:s)	(°′′′)	
	BL175JX	24-apr-2017	$\mathbf{C}$	$04 \ 35 \ 48.11$	$22 \ 53 \ 29.1$	J0438+2153, J0426+2327, J0435+2532, J0450+2249

NOTE—We provide for each field the NRAO project code, epoch of observation, observed band, coordinates of the field center and the calibrators (the main calibrator is the first source in the list).

 Table 2. VLBA detections and non-detections in Taurus.

Other Identifier		Minimum Flux at 5.0 GHz (mJv)	Maximum Flux at 5.0 GHz (mJv)	Minimum Flux at 8.4 GHz (mJv)	Maximum Flux at 8.4 GHz (mJv)	$\log T_B$	$Type^{b}$	Number Det./Obs.
	(2)	at 9.0 HIL (1997) (3)	(4) (4) (4)	au 0.4 June (1997) (5)	(6) (6)	(2)	(8)	(9)
/1096Ta	Au	$0.71 \pm 0.05$	$9.20 \pm 0.07$	$0.38 \pm 0.08$	$0.55 \pm 0.08$	8.03	ASO	4/7
71096T	auB	$0.23\pm0.04$	$0.36\pm0.05$		:	6.75	$\rm VSO$	2/7
√773Ta	uAa	$2.77\pm0.07$	$11.89\pm0.07$	$0.36\pm0.08$	$22.23\pm0.20$	8.66	$\gamma$ VSO	2/2
√773Ta	dAb	$1.56 \pm$	= 0.07	$0.54\pm0.11$	$1.57\pm0.10$	7.45	$_{\rm VSO}$	3/7
V10987	lau	$0.22\pm0.06$	$0.29\pm0.06$	1.41 =	± 0.10	7.48	$_{\rm VSO}$	3/7
V1068T	au	11.19	± 0.09	0.40 =	± 0.13	8.34	$\rm VSO$	2/7
MASS	J04182909 + 2826191	$0.54 \pm$	= 0.05	1.31 =	± 0.10	7.47	$_{\rm VSO}$	2/8
HD2835	518, V410Tau	$1.40\pm0.05$	$3.59\pm0.06$	$0.72\pm0.09$	$13.62\pm0.22$	8.44	$\rm VSO$	8/8
V892Te	11	$0.22 \pm$	= 0.06	$0.33\pm0.10$	$0.38\pm0.11$	6.60	$\rm VSO$	3/13
Hubble	4a, V1023TauA	$0.63\pm0.06$	$1.44\pm0.04$	$0.48\pm0.09$	$14.94\pm0.44$	8.53	$_{\rm VSO}$	13/13
Jubbl€	94b, V1023TauB	$0.52\pm0.04$	$0.52\pm0.05$	·	:	6.95	$\rm VSO$	2/13
V1070	Tau	$0.29 \pm$	= 0.06	0.58 =	± 0.10	7.02	$_{\rm VSO}$	2/7
$\Gamma Tau$		$2.06\pm0.06$	$2.62\pm0.07$	$1.58\pm0.09$	$4.58\pm0.09$	7.65	$_{\rm VSO}$	8/8
MASS	$304220069 \pm 2657324$	$0.15 \pm$	= 0.05	) >	).14	6.15	$_{\rm VSO}$	1/7
MASS	$5J04220496 \pm 1934483$	$0.19 \pm$	= 0.05	) >	.11	6.48	$_{\rm VSO}$	1/8
V1201	$\operatorname{TauA}$	$2.40 \pm$	= 0.04	•	:	7.64	$\rm VSO$	1/7
V1201	TauB	$0.13\pm0.04$	$0.45\pm0.04$	$0.52\pm0.07$	$0.53\pm0.06$	7.00	$_{\rm VSO}$	5/7
HD283	641	$0.36 \pm$	= 0.07	$0.45\pm0.08$	$0.91\pm0.09$	7.26	$_{\rm VSO}$	4/5
MAS	5J04292071 + 2633406	•		0.22 =	± 0.07	6.65	$_{\rm VSO}$	1/4
DITau		$0.46 \pm$	= 0.05	< (	.11	6.73	$_{\rm VSO}$	1/8
KZTau		$0.18\pm0.05$	$0.70\pm0.05$	0.37 =	± 0.10	7.06	$_{\rm VSO}$	4/8
V807T	au	$0.28\pm0.05$	$1.83\pm0.05$	0.36 =	± 0.07	7.51	$_{\rm VSO}$	3/7
V830T	au	< 0	.07	0.50 =	± 0.08	7.01	$\rm VSO$	1/7
V1110	Tau	< 0	.07	$0.39\pm0.08$	$0.57\pm0.07$	7.06	$_{\rm VSO}$	3/6

10													G	rALI		IА	ь.														
	Number	Det./Obs	(6)	1/8	1/8	8/8	4/10	6/9	5/9	2/6	2/7	1/7	1/5	2/2	1/2	9/9	5/5	3/4	3/6	4/4	4/4	5/5	2/5	4/4	5/5	4/4	5/5	3/6	4/4		
	$\operatorname{Type}^{\mathrm{b}}$		(8)	$\rm VSO$	$\rm VSO$	$\rm VSO$	M	M	$\mathbf{VSO}$	$_{\rm VSO}$	Star?	Star?	Star?	Star?	Star?	В	В	В	В	В	В	В	В	В	В	В	В	В	В		
	$\log T_B$		(2)	6.53	7.20	7.90	7.17	7.18	6.59	6.85	6.62	6.57	6.59	9.27	8.93	7.31	7.06	6.82	6.80	7.95	7.04	8.62	6.75	6.81	9.09	8.77	7.17	6.64	7.33		
	Maximum Flux	Maximum Flux at 8.4 GHz (mJy) (6) ).10	$0.10 \pm 0.08$	$3.07\pm0.08$	.12	$0.29\pm0.09$	$0.22\pm0.08$	$1 \pm 0.08$	$\theta \pm 0.06$	0.07	$0.20\pm0.07$	$104.64\pm4.43$	$\pm 3.98$	$0.76\pm0.08$	$0.54\pm0.09$	$0.37\pm0.08$	= 0.08	$4.48\pm0.09$	$0.55\pm0.07$	$17.62\pm0.10$	$0.29\pm0.08$	$0.47\pm0.11$	$68.91\pm0.64$	$27.71\pm0.18$	$0.64\pm0.09$	= 0.07	$1.08\pm0.08$				
	Minimum Flux	at 8.4 GHz $(mJy)$	(5)	< 0	0.94 =	$0.46\pm0.08$	~	$0.22\pm0.08$	$0.19\pm0.07$	0.34 =	0.19 =	0.20 =	0.20 =	$52.79\pm6.66$	47.72	$0.61\pm0.08$	$0.23\pm0.06$	$0.31\pm0.07$	0.32 =	$3.87\pm0.07$	$0.19\pm0.05$	$13.33\pm0.13$	$0.16\pm 0.05$	$0.23\pm0.07$	$7.84\pm0.36$	$20.39\pm0.13$	$0.34\pm0.09$	0.22 =	$0.55\pm0.06$		
ole 2 (continued)	Maximum Flux	at 5.0 GHz $(mJy)$	(4)	0.05	± 0.05	(4) E 0.05	0.05 07	$4.55\pm0.05$	$0.83\pm0.05$	$0.96\pm0.05$	$0.22\pm0.05$	: 0.04	: 0.04	.05	.07			$1.14\pm0.05$		: 0.05	$0.24\pm0.04$								: 0.05	$0.20\pm0.05$	
Tab	Minimum Flux	at 5.0 GHz $(mJy)$	at 5.0 GHz (mJy) a (3) (3) $0.22 \pm 0$ $< 0.0^{\circ}$ $0.66 \pm 0.05$ $0.15 \pm 0.04$ $0.13 \pm 0.05$ $0.11 \pm 0.04$ $0.11 \pm 0.04$ $0.37 \pm 0$	$0.37 \pm$	$0.12 \pm$	< 0.	< 0	:	:	$1.13\pm0.05$	:	$0.33 \pm$	$0.19\pm0.05$	:	:	:	:	:	:	:	$0.37 \pm$	$0.16\pm0.05$	:								
	Other	Identifier	(2)	FFTau	2MASSJ04354203+2252226	HPTauG2	V999Tau	V1000TauA	V1000TauB	HD282630	SDSSJ042922.24 + 263728.7		WISEJ043113.00+270834.9	VCS4J0450 + 2249a	VCS4J0450+2249b		WISEJ041515.85+291244.3	WISEJ041825.43 + 252156.4		SDSSJ042452.47 + 264204.5	JH507	2MASSJ04292949+2631528			$2MASSJ04322946 \pm 1814002$	XEST03-026		WISEJ043305.95 + 243253.8	SDSSJ043326.34+222831.9		
	$GBS-VLA^{a}$	Identifier	(1)	$J043520.92 {+} 225424.0$	$J043542.05 \pm 22522.5$	J043554.17 + 225413.3	$J044205.49 \pm 25226.0$	$J044207.32\!+\!252303.0$	$J044207.32\!+\!252303.0$	J045536.97 + 301754.8	$J042922.26\!+\!263728.6$	J042926.77 + 263047.8	J043113.01 + 270834.8			J041443.21 + 275347.5	J041515.93 + 291244.5	$J041825.42 {+} 252156.4$	J042449.45 + 264304.1	$J042452.48 {+}264204.5$	$J042920.74 {+} 263353.4$	J042929.49 + 263152.8	J042939.59 + 263110.7	$J043109.20 {+} 271045.3$	$J043229.46{+}181400.3$	J043235.22 + 242021.4	$J043237.91 {+} 242054.5$	J043306.02 + 243254.4	J043326.35 + 222832.0		

Table 2 continued

16

(continued)	
Table 2	

Other	Minimum Flux	Maximum Flux	Minimum Flux	Maximum Flux	$\log T_B$	$\operatorname{Type}^{\mathrm{b}}$	Number
er a	t $5.0 \text{ GHz} (\text{mJy})$	at $5.0 \text{ GHz} (\text{mJy})$	at $8.4 \text{ GHz} (mJy)$	at 8.4 GHz $(mJy)$			Det./Obs.
	(3)	(4)	(5)	(9)	(2)	(8)	(6)
255815.0	$0.17\pm0.05$	$0.19\pm0.06$	$0.16\pm0.06$	$0.18\pm0.06$	6.51	В	4/6
252505.6	$0.27\pm0.07$	$0.43\pm0.06$	$0.28\pm0.06$	$0.30\pm0.08$	7.13	В	7/10
52505.6	:	:	$0.94\pm0.12$	$1.81\pm0.10$	7.58	В	8/8
	:	:	$0.17\pm0.05$	$0.27\pm0.06$	6.72	В	2/4
1825.3	:	:	$0.67\pm0.07$	$0.76\pm0.09$	7.17	В	4/4
1905.1	:	:	$3.61\pm0.14$	$4.26\pm0.12$	7.91	В	4/4
22103	:	:	$3.20\pm0.09$	$4.15\pm0.08$	7.90	В	4/4
627.1	:	:	$0.72\pm0.06$	$1.00\pm0.08$	7.23	В	4/4
	:	:	$0.22\pm0.06$	$0.47\pm0.09$	6.94	В	4/4
	:	:	) >	0.12	÷	÷	0/4
	:	:	~	0.12	:	:	0/4
1561	:	:	~	0.14	:	÷	0/4
17.7	< 0	0.06	~	0.10	:	÷	2/0
	:	:	~	0.10	:	:	0/4
7321	< 0	.08	~	0.13	:	$\Lambda$	0/0
	< 0	.07	~	0.11	:	:	0/13
20264	< 0	.07	~	0.13	:	$\Lambda$	0/8
50481	:	:	~	0.13	:	÷	0/5
	:	:	~	0.13	:	$\Lambda$	0/5
953.5	:	:	~	0.14	:	÷	0/4
	< 0	.09	~	0.13	:	$\rm VSO$	0/0
	:	:	) ~	0.14	:	÷	0/4
1748.5	< 0	0.06	) ~	0.11	:	÷	0/5
	:	:	) >	0.11	:	÷	0/5
0843.4	:	:	) ~	0.12	:	:	0/4
	:	:	) >	111	:	$\rm YSO$	0/4

Table 2 continued

17

10														,							Í
	Number	Det./Obs	(6)	0/4	0/5	0/5	0/4	0/5	0/4	2/0	2/0	0/5	0/4	0/3	0/4	2/0	0/4	0/4	0/4	0/4	
	$\operatorname{Type}^{\mathrm{b}}$		(8)	:	:	$\gamma$ VSO	:	$\rm VSO$	:	:	:	$\rm VSO$	$\rm VSO$	:	:	:	:	:	:	:	
	$\log T_B$		(2)	:	:	÷	:	:	:	:	:	:	:	:	:	÷	:	:	:	:	
Table 2 (continued)	Maximum Flux	at 8.4 GHz $(mJy)$	(9)	11.(	).10	.11	.11	60.(	).12	0.10	60.(	60.(	0.10	0.10	.11	.11	.11	.11	0.10	0.10	12)
	Minimum Flux	at $8.4 \text{ GHz} (mJy)$	(5)	~	) ~	) V	) >	) >	< 0.	$\sim$	V	V	) >	) >	V	< 0.	~	) >	) >	) >	d hw Dzih at al (901
	Maximum Flux	at $5.0 \text{ GHz} (\text{mJy})$	(4)							20.	20.										) identifier is defined
	Minimum Flux	at $5.0 \text{ GHz} (\text{mJy})$	(3)	:	:	:	:	:	:	< 0 >	< 0	:	:	:	:	:	:	:	:	:	I area Arran Curron
	Other	Identifier	(2)		V1073Tau, HD285845	LDN1551IRS5B	SDSSJ043148.70 + 254021.6	V827Tau		EZTau		HPTauG3	2MASSJ04355892 + 2238353				WISEJ044307.66+252347.5	XEST26-028			CBS VI A (Could's Balt Vour
	$GBS-VLA^{a}$	Identifier	(1)	J043116.56 + 271006.9	J043125.13 + 181616.6	J043134.15 + 180804.6	J043148.73 + 254021.8	$J043214.58{+}182014.6$	J043235.57 + 242008.5	J043513.27 + 225920.2	J043550.97 + 225339.3	$J043553.52 {+} 225408.9$	$J043558.97 {+} 223835.2$	$J043657.44 {+} 241835.1$	J044123.47 + 245528.1	J044209.56 + 252427.7	J044307.69 + 252348.2	$J045534.44 {+} 302808.3$	J045605.30 + 302541.7	J045607.27 + 302728.2	a The

<sup>w</sup> The GBS-VLA (Gould's Belt Very Large Array Survey) identifier is defined by Dzib et al. (2015).  $^b$  Type of source: "YSO" = Young Stellar Object, "Star?" = field star and "B" = background source (Galactic or extragalactic).

18

## Galli et al.

1	$\mathbf{\Omega}$
	ч
-	$\cdot \cdot \cdot$

Project Code	Date	Source	Calibrators <sup>a</sup>
BM198A	11-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198B	12-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198C	13-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198D	14-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198E	15-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198F	16-mar-2004	V773Tau A	J0403+2600, J0408+3032
BM198G	17-mar-2004	V773Tau A	J0403+2600, J0408+3032
BL128AA	08-sep- $2005$	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL128AB	15-nov- $2005$	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL128AC	21-jan-2006	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL128AD	01-apr-2006	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL128AE	12-jun-2006	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL128AF	05-sep-2006	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146B	23-aug-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146C	29-aug-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146D	05-sep- $2007$	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146E	11-sep- $2007$	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146F	16-sep-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146G	21-sep-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146H	27-sep-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146I	03-oct-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146J	09-oct-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146K	17-oct-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146L	23-oct-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146M	27-oct-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL146N	17-nov-2007	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BM306	27-sep-2009	V773Tau A	J0408+3032, J0403+2600, J0429+2724, J0356+2903
BL124BA	19-sep-2004	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124BB	04-jan-2005	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124BC	25-mar-2005	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124BD	04-jul-2005	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL136AA	18-sep- $2005$	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL136AB	28-dec- $2005$	V1023Tau	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124CA	22-sep-2004	HDE 283572	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124CB	06-jan-2005	HDE 283572	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL124CC	30-mar-2005	HDE 283572	J0429+2724, J0433+2905, J0408+3032, J0403+2600

 Table 3. VLBA data in Taurus from the NRAO archive.

 $Table \ 3 \ continued$ 

Galli et al.

Table 3 (continued)

Project Code	Date	Source	Calibrators <sup>a</sup>
BL124CD	23-jun-2005	HDE 283572	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL136BA	23-sep- $2005$	HDE 283572	J0429+2724, J0433+2905, J0408+3032, J0403+2600
BL136BB	24-dec- $2005$	HDE 283572	$J0429+2724,\ J0433+2905,\ J0408+3032,\ J0403+2600$
BL128BA	07-sep-2005	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL128BB	16-nov-2005	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL128BC	23-jan-2006	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL128BD	31-mar-2006	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL128BE	10-jun-2006	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL128BF	08-sep-2006	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BT093AB	03-sep- $2007$	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BT093AC	04-dec- $2007$	HPTauG2	J0426+2327, J0435+2532, J0449+1754
BL118A	24-sep-2003	TTau	J0428+1732, J0431+1731
BL118B	18-nov-2003	TTau	J0428+1732, J0431+1731
BL118C	15-jan-2004	TTau	J0428+1732, J0431+1731
BL118D	26-mar-2004	TTau	J0428+1732, J0431+1731
BL118E	13-may-2004	TTau	J0428+1732, J0431+1731
BL118F	08-jul-2004	TTau	J0428+1732, J0431+1731
BL124AA	16-sep-2004	TTau	J0428+1732, J0426+2327, J0412+1856
BL124AB	09-nov-2004	TTau	J0428+1732, J0426+2327, J0412+1856
BL124AC	28-dec- $2004$	TTau	J0428+1732, J0426+2327, J0412+1856
BL124AD	23-feb-2005	TTau	J0428+1732, J0426+2327, J0412+1856
BL124AE	09-may-2005	TTau	J0428+1732, J0426+2327, J0412+1856
BL124AF	08-jul-2005	TTau	J0428+1732, J0426+2327, J0412+1856

<sup>a</sup> The main calibrator is the first source in the list.

### REFERENCES

Bertout, C., & Genova, F. 2006, A&A, 460, 499

- Dobashi, K., Uehara, H., Kandori, R., et al. 2005, PASJ, 57, S1
- Duchêne, G. 1999, A&A, 341, 547
- Dzib, S. A., Loinard, L., Rodríguez, L. F., et al. 2015, ApJ, 801, 91
- Foreman-Mackey, D., Hogg, D. W., Lang, D., & Goodman, J. 2013, PASP, 125, 306
- Goodman, J., & Weare, J. 2010, Communications in Applied Mathematics and Computational Science, 5, 65
- Greisen, E. W. 2003, Information Handling in Astronomy -Historical Vistas, 285, 109
- Loinard, L., Torres, R. M., Mioduszewski, A. J., et al. 2007, ApJ, 671, 546

Lynds, B. T. 1962, ApJS, 7, 1

- Menten, K. M., Reid, M. J., Forbrich, J., & Brunthaler, A. 2007, A&A, 474, 515
- Ortiz-León, G. N., Loinard, L., Kounkel, M. A., et al. 2017, ApJ, 834, 141
- Pradel, N., Charlot, P., & Lestrade, J.-F. 2006, A&A, 452, 1099
- Seidelmann, P. K. 1992, Explanatory Supplement to the Astronomical Almanac. A revision to the Explanatory Supplement to the Astronomical Ephemeris and the American Ephemeris and Nautical Almanac.
- van de Kamp, P. 1967, Principles of Astrometry. (W. H. Freeman and Company)