KaVA/EAVN OBSERVING APPLICATION

VLBI: ☐ **KaVA or** ☒ **EAVN**

TERM: 2019B

Proposal ID: EAVN 19B-00
Received Date: 2019/00/00

1. Title of proposal: Where the KVN is located?

2. Authors: (PI on the 1st line)

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			No

*If any student is involved, please give the following information.
☐ M.S. ☐ Ph.D For thesis? ☐ Yes ☐ No

3. Contact author:
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4. Staff support:
– Schedule preparation: ☒ None ☐ Consultation ☐ Extensive help
– Data reduction: ☒ None ☐ Consultation ☐ Extensive help

5. Proposal type: ☐ KaVA normal proposal(<100hrs) ☐ KaVA ToO proposal ☐ Continuation ☐ Recovery
☒ EAVN normal proposal(<24hrs) ☐ EAVN large proposal • Related proposal ID (if any):_

6. Scientific categories:
☐ Galactic ☒ Extragalactic ☒ AGN ☐ Star formation ☐ Evolved star ☒ Absolute astrometry

7. Observing type:
☒ Continuum ☐ Spectral line KaVA only: ☐ Fast antenna nodding ☐ 1-beam (K/Q) hybrid

8. Observing frequency:
☒ 22GHz ☐ 43GHz, KVN setup (see explanation): ☒ 22GHz ☐ 43GHz ☐ 86GHz

9. Observing sessions: ☐ single epoch ☒ multiple epochs
– Total time requested: 30 hrs
– Number of sessions: 2 ; Number of hour each: 24 and 6 hrs ; Min/Max Separation: schedule the 2nd session after analyzing
– Min/Max LST (HH:MM:SS): hh1:mm1:ss1 – hh2:mm2:ss2
– Preferred range of dates or dates which are NOT acceptable:

10. Abstract (200 words max)

Despite the KVN observes for 8 years, we still do not know precise positions of KVN stations. We propose geodetic observations with the goal of determining positions of KVN stations with a millimeter level of accuracy. Such observations are needed for precise astrometry with the KVN and EAVN.

When your proposal is scheduled the contents of this application form (but not supporting material) will be made public.

This LaTeX form was generated on May 31, 2019

VLBI

Title of Proposal: Where the KVN is located?

11. Recording format: [×] 16 MHz × 16 channels [ ] 32 MHz × 8 channels [ ] 128 MHz × 2 channels (KaVA only)

Recording rate: [×] 1 Gbps

12. Spectroscopy only (if more lines, please attach list)

Items	Line 1	Line 2	Line 3	Line 4	Line 5
Transitions to be observed	n/a	n/a	n/a	n/a	n/a
Velocity range in LSR (km s^{-1})					
Channel bandwidth (kHz)					
Rest frequency (MHz)					

13. Total number of sources (including calibrators): 297 [If more than 8 sources, please attach list]

14. Name [sorted in ra]	**Coordinates (J2000)**		**Approx. Frequency (MHz)**	**Approx. Flux Density (mJy/beam)**	**Time Requested (min)**	**Cal? (Y/N)**
	RA (hh:mm:ss.ss)	**DEC** (±dd:mm:ss.ss)				

15. Correlation setup:

128 Default (128/512 channels per 16 MHz bandwidth for continuum and spectral line, respectively)

[ ] Special request (if so, please provide following information)

– Averaging time: 0.8 sec ; Spectral channels per bandwidth: 128

16. Special requirements

– Sites : We propose to include BADARY and ZELENCHK
– Dates :
– Frequencies : Should be spread over 512 MHz bandwidth. We propose for KVN stations to record dual polarization.
– etc :

17. Attach a scientific justification maximum 2 pages including figures. If necessary, attach a technical justification (1 page only). Minimum font size 10 point.

EEEAVN_Proposal.tex; Version 2019B

The source list. *Beginning...*

	RA J2000	DEC J2000	Freq (GHz)	Flux (mJy)	Int time (min)	Pos. Err (mas)
0003+380	00:05:57.1753	+38:20:15.148	22	> 250	2	< 0.3
0003−066	00:06:13.8928	−06:23:35.335	22	> 250	2	< 0.3
0010−401	00:12:59.9098	−39:54:26.053	22	> 250	2	< 0.3
0010+405	00:13:31.1302	+40:51:37.144	22	> 250	2	< 0.3
0012+610	00:14:48.7921	+61:17:43.542	22	> 250	2	< 0.3
0014+813	00:17:08.4749	+81:35:08.136	22	> 250	2	< 0.3
0019+058	00:22:32.4412	+06:08:04.268	22	> 250	2	< 0.3
0027+056	00:29:45.8963	+05:54:40.712	22	> 250	2	< 0.3
0035+413	00:38:24.8435	+41:37:06.000	22	> 250	2	< 0.3
0035−252	00:38:14.7355	−24:59:02.235	22	> 250	2	< 0.3
0039+568	00:42:19.4516	+57:08:36.585	22	> 250	2	< 0.3
0048−071	00:51:08.2098	−06:50:02.229	22	> 250	2	< 0.3
0054+161	00:56:55.2943	+16:25:13.341	22	> 250	2	< 0.3
0102−245	01:04:58.2053	−24:16:28.445	22	> 250	2	< 0.3
0104−275	01:06:26.0820	−27:18:11.825	22	> 250	2	< 0.3
0104−408	01:06:45.1079	−40:34:19.960	22	> 250	2	< 0.3
0106+612	01:09:46.3443	+61:33:30.455	22	> 250	2	< 0.3
0109+224	01:12:05.8247	+22:44:38.786	22	> 250	2	< 0.3
0110+318	01:12:50.3330	+32:08:17.432	22	> 250	2	< 0.3
0109+351	01:12:12.9444	+35:22:19.336	22	> 250	2	< 0.3
0111+021	01:13:43.1449	+02:22:17.316	22	> 250	2	< 0.3
0110+495	01:13:27.0068	+49:48:24.043	22	> 250	2	< 0.3
0115−214	01:17:48.7801	−21:11:06.633	22	> 250	2	< 0.3
0116−219	01:18:57.2621	−21:41:30.140	22	> 250	2	< 0.3
0119+041	01:21:56.8616	+04:22:24.734	22	> 250	2	< 0.3
0123+257	01:26:42.7926	+25:59:01.300	22	> 250	2	< 0.3
0125+487	01:28:08.0633	+49:01:05.985	22	> 250	2	< 0.3
0125+628	01:28:30.5650	+63:06:29.882	22	> 250	2	< 0.3
0127+145	01:29:55.3471	+14:46:47.835	22	> 250	2	< 0.3
0135−247	01:37:38.3464	−24:30:53.885	22	> 250	2	< 0.3
3C48	01:37:41.2995	+33 09 35.133	22	> 250	2	< 0.3
0142−278	01:45:03.3946	−27:33:34.329	22	> 250	2	< 0.3
0146+056	01:49:22.3708	+05:55:53.568	22	> 250	2	< 0.3
0151+474	01:54:56.2898	+47:43:26.539	22	> 250	2	< 0.3
0159+418	02:02:43.6533	+42:05:16.332	22	> 250	2	< 0.3
0159+723	02:03:33.3849	+72:32:53.667	22	> 250	2	< 0.3
0202−172	02:04:57.6743	−17:01:19.840	22	> 250	2	< 0.3
0202+319	02:05:04.9253	+32:12:30.095	22	> 250	2	< 0.3
0214−330	02:16:48.1854	−32:47:40.851	22	> 250	2	< 0.3
0215+015	02:17:48.9547	+01:44:49.699	22	> 250	2	< 0.3
0216+011	02:19:07.0245	+01:20:59.866	22	> 250	2	< 0.3
0219+428	02:22:39.6114	+43:02:07.798	22	> 250	2	< 0.3
0221+067	02:24:28.4281	+06:59:23.341	22	> 250	2	< 0.3
0226−038	02:28:53.2112	−03:37:37.126	22	> 250	2	< 0.3
0227+403	02:30:45.7107	+40:32:53.067	22	> 250	2	< 0.3
0249+171	02:52:07.7185	+17:18:42.685	22	> 250	2	< 0.3
0250−225	02:52:47.9536	−22:19:25.465	22	> 250	2	< 0.3
0250+320	02:53:33.6501	+32:17:20.891	22	> 250	2	< 0.3
0256+075	02:59:27.0766	+07:47:39.642	22	> 250	2	< 0.3
0256+192	02:59:29.6559	+19:25:44.327	22	> 250	2	< 0.3
0258+533	03:02:22.7354	+53:31:46.484	22	> 250	2	< 0.3
0309+411	03:13:01.9621	+41:20:01.183	22	> 250	2	< 0.3
3C84	03:19:48.1601	+41:30:42.105	22	> 250	2	< 0.3
0322+222	03:25:36.8143	+22:24:00.365	22	> 250	2	< 0.3
0327−241	03:29:54.0755	−23:57:08.773	22	> 250	2	< 0.3
0342+538	03:46:34.5041	+54:00:59.108	22	> 250	2	< 0.3
0344+558	03:47:56.8120	+55:57:31.578	22	> 250	2	< 0.3
0350−253	03:52:11.0523	−25:14:50.267	22	> 250	2	< 0.3
0354+231	03:57:21.6098	+23:19:53.825	22	> 250	2	< 0.3

The source list ... *Continue*

	RA J2000 RA J2000	DEC J2000 DEC J2000	Freq (GHz)	Flux (mJy)	Int time (min)	Pos. Err (mas)
0354+559	03:58:30.1881	+56:06:44.460	22	> 250	2	< 0.3
0356+322	03:59:44.9129	+32:20:47.155	22	> 250	2	< 0.3
NRAO150	03:59:29.7472	+50:57:50.161	22	> 250	2	< 0.3
0401−248	04:03:41.7360	−24:44:08.458	22	> 250	2	< 0.3
0402−362	04:03:53.7498	−36:05:01.913	22	> 250	2	< 0.3
0405−385	04:06:59.0353	−38:26:28.042	22	> 250	2	< 0.3
0405−331	04:07:33.9137	−33:03:46.359	22	> 250	2	< 0.3
0412+447	04:15:56.5265	+44:52:49.683	22	> 250	2	< 0.3
0415+379	04:18:21.2772	+38:01:35.800	22	> 250	2	< 0.3
0415+398	04:19:22.5495	+39:55:28.977	22	> 250	2	< 0.3
0420+022	04:22:52.2146	+02:19:26.930	22	> 250	2	< 0.3
0418+532	04:22:44.3988	+53:24:26.263	22	> 250	2	< 0.3
0420+417	04:23:56.0097	+41:50:02.712	22	> 250	2	< 0.3
0422+004	04:24:46.8420	+00:36:06.329	22	> 250	2	< 0.3
0421+464	04:24:39.1653	+46:36:32.280	22	> 250	2	< 0.3
0422−380	04:24:42.2436	−37:56:20.784	22	> 250	2	< 0.3
0426−380	04:28:40.4242	−37:56:19.580	22	> 250	2	< 0.3
3C120	04:33:11.0955	+05:21:15.619	22	> 250	2	< 0.3
0440−285	04:42:37.6571	−28:25:30.835	22	> 250	2	< 0.3
0444+634	04:49:23.3105	+63:32:09.434	22	> 250	2	< 0.3
0459+252	05:02:58.4747	+25:16:25.274	22	> 250	2	< 0.3
0502+049	05:05:23.1847	+04:59:42.724	22	> 250	2	< 0.3
0503+466	05:07:23.6588	+46:45:42.339	22	> 250	2	< 0.3
0506+101	05:09:27.4570	+10:11:44.600	22	> 250	2	< 0.3
0507+179	05:10:02.3691	+18:00:41.581	22	> 250	2	< 0.3
0511−220	05:13:49.1143	−21:59:16.092	22	> 250	2	< 0.3
0530−388	05:32:02.0618	−38:48:54.344	22	> 250	2	< 0.3
0534−340	05:36:28.4323	−34:01:11.468	22	> 250	2	< 0.3
0538+474	05:41:49.2455	+47:29:07.611	22	> 250	2	< 0.3
0540−092	05:42:55.8774	−09:13:31.005	22	> 250	2	< 0.3
0544+273	05:47:34.1489	+27:21:56.842	22	> 250	2	< 0.3
0548+378	05:52:17.9369	+37:54:25.282	22	> 250	2	< 0.3
0602+673	06:07:52.6716	+67:20:55.410	22	> 250	2	< 0.3
0610+260	06:13:50.1391	+26:04:36.719	22	> 250	2	< 0.3
0618−284	06:20:29.3587	−28:27:36.083	22	> 250	2	< 0.3
0630−261	06:32:06.5018	−26:14:14.035	22	> 250	2	< 0.3
0632−235	06:34:59.0009	−23:35:11.957	22	> 250	2	< 0.3
0633+734	06:39:21.9612	+73:24:58.040	22	> 250	2	< 0.3
0639−032	06:41:51.1329	−03:20:48.582	22	> 250	2	< 0.3
0640+090	06:43:26.4450	+08:57:38.011	22	> 250	2	< 0.3
0650+453	06:54:23.7136	+45:14:23.545	22	> 250	2	< 0.3
0653−033	06:56:11.1205	−03:23:06.782	22	> 250	2	< 0.3
0654+244	06:57:05.6755	+24:23:55.394	22	> 250	2	< 0.3
0707−028	07:09:45.0546	−02:55:17.496	22	> 250	2	< 0.3
0708+506	07:12:43.6835	+50:33:22.707	22	> 250	2	< 0.3
0716−181	07:18:14.1580	−18:13:04.055	22	> 250	2	< 0.3
0716+477	07:20:21.4977	+47:37:44.124	22	> 250	2	< 0.3
0721−071	07:24:17.2926	−07:15:20.353	22	> 250	2	< 0.3
0728−235	07:31:06.6679	−23:41:47.870	22	> 250	2	< 0.3
0730+504	07:33:52.5205	+50:22:09.062	22	> 250	2	< 0.3
0734−154	07:37:16.2346	−15:34:05.878	22	> 250	2	< 0.3
0735+178	07:38:07.3937	+17:42:18.998	22	> 250	2	< 0.3
0736+017	07:39:18.0338	+01:37:04.617	22	> 250	2	< 0.3
0738+548	07:42:39.7906	+54:44:24.666	22	> 250	2	< 0.3
0741−379	07:43:44.8205	−38:03:56.402	22	> 250	2	< 0.3
0742+103	07:45:33.0595	+10:11:12.692	22	> 250	2	< 0.3
0745−165	07:48:03.0838	−16:39:50.253	22	> 250	2	< 0.3
0802−010	08:05:12.8884	−01:11:13.795	22	> 250	2	< 0.3
0803+452	08:06:33.4725	+45:04:32.271	22	> 250	2	< 0.3
0805−077	08:08:15.5360	−07:51:09.886	22	> 250	2	< 0.3

The source list ... *Continue*

	RA J2000 RA J2000	DEC J2000 DEC J2000	Freq (GHz)	Flux (mJy)	Int time (min)	Pos. Err (mas)
0812+367	08:15:25.9448	+36:35:15.148	22	> 250	2	< 0.3
0821+394	08:24:55.4838	+39:16:41.904	22	> 250	2	< 0.3
0823−223	08:26:01.5729	−22:30:27.203	22	> 250	2	< 0.3
0826−373	08:28:04.7802	−37:31:06.281	22	> 250	2	< 0.3
0827+243	08:30:52.0861	+24:10:59.820	22	> 250	2	< 0.3
0834−201	08:36:39.2152	−20:16:59.504	22	> 250	2	< 0.3
0855−196	08:58:05.3632	−19:50:36.935	22	> 250	2	< 0.3
0859+470	09:03:03.9901	+46:51:04.137	22	> 250	2	< 0.3
0902−309	09:04:20.5158	−31:11:25.667	22	> 250	2	< 0.3
0912+029	09:14:37.9134	+02:45:59.246	22	> 250	2	< 0.3
0917+449	09:20:58.4584	+44:41:53.985	22	> 250	2	< 0.3
0945+408	09:48:55.3381	+40:39:44.586	22	> 250	2	< 0.3
1004+141	10:07:41.4980	+13:56:29.600	22	> 250	2	< 0.3
1005+066	10:08:00.8161	+06:21:21.215	22	> 250	2	< 0.3
1010+350	10:13:49.6140	+34:45:50.783	22	> 250	2	< 0.3
1012+232	10:14:47.0654	+23:01:16.570	22	> 250	2	< 0.3
1013+054	10:16:03.1364	+05:13:02.341	22	> 250	2	< 0.3
1015+359	10:18:10.9881	+35:42:39.440	22	> 250	2	< 0.3
1016−311	10:18:28.7534	−31:23:53.849	22	> 250	2	< 0.3
1020+400	10:23:11.5656	+39:48:15.385	22	> 250	2	< 0.3
1027+749	10:31:22.0240	+74:41:58.345	22	> 250	2	< 0.3
1030+611	10:33:51.4290	+60:51:07.334	22	> 250	2	< 0.3
1032−199	10:35:02.1553	−20:11:34.359	22	> 250	2	< 0.3
1036−154	10:39:06.7051	−15:41:06.692	22	> 250	2	< 0.3
1040+244	10:43:09.0357	+24:08:35.409	22	> 250	2	< 0.3
1044+719	10:48:27.6199	+71:43:35.938	22	> 250	2	< 0.3
1059+282	11:02:14.2884	+27:57:08.689	22	> 250	2	< 0.3
1101+384	11:04:27.3139	+38:12:31.798	22	> 250	2	< 0.3
1113+087	11:16:09.9733	+08:29:22.032	22	> 250	2	< 0.3
1115−122	11:18:17.1414	−12:32:54.261	22	> 250	2	< 0.3
1143−287	11:46:26.1885	−28:59:18.504	22	> 250	2	< 0.3
1145−071	11:47:51.5540	−07:24:41.141	22	> 250	2	< 0.3
1144−379	11:47:01.3707	−38:12:11.023	22	> 250	2	< 0.3
1147+245	11:50:19.2121	+24:17:53.835	22	> 250	2	< 0.3
1147−063	11:50:23.9867	−06:40:26.572	22	> 250	2	< 0.3
1149−084	11:52:17.2095	−08:41:03.313	22	> 250	2	< 0.3
1150+497	11:53:24.4666	+49:31:08.830	22	> 250	2	< 0.3
1150+812	11:53:12.4992	+80:58:29.154	22	> 250	2	< 0.3
1156+295	11:59:31.8339	+29:14:43.826	22	> 250	2	< 0.3
1202−262	12:05:33.2123	−26:34:04.464	22	> 250	2	< 0.3
1204+281	12:07:27.9004	+27:54:58.849	22	> 250	2	< 0.3
1206−238	12:09:02.4451	−24:06:20.759	22	> 250	2	< 0.3
1213−172	12:15:46.7517	−17:31:45.403	22	> 250	2	< 0.3
1222+037	12:24:52.4219	+03:30:50.292	22	> 250	2	< 0.3
3C274	12:30:49.4233	+12:23:28.043	22	> 250	2	< 0.3
1244−255	12:46:46.8020	−25:47:49.289	22	> 250	2	< 0.3
1255−316	12:57:59.0608	−31:55:16.851	22	> 250	2	< 0.3
1255−177	12:58:38.3017	−18:00:03.124	22	> 250	2	< 0.3
1256−229	12:59:08.4620	−23:10:38.654	22	> 250	2	< 0.3
1300+580	13:02:52.4652	+57:48:37.609	22	> 250	2	< 0.3
1308+326	13:10:28.6638	+32:20:43.782	22	> 250	2	< 0.3
1308+328	13:10:59.4027	+32:33:34.449	22	> 250	2	< 0.3
1329−049	13:32:04.4646	−05:09:43.305	22	> 250	2	< 0.3
1331−195	13:33:45.1756	−19:50:42.343	22	> 250	2	< 0.3
1333−082	13:36:08.2598	−08:29:51.796	22	> 250	2	< 0.3
1336−260	13:39:19.8907	−26:20:30.495	22	> 250	2	< 0.3
1339−206	13:42:04.7395	−20:51:29.541	22	> 250	2	< 0.3
1339−287	13:42:15.3456	−29:00:41.831	22	> 250	2	< 0.3
1343+451	13:45:33.1724	+44:52:59.572	22	> 250	2	< 0.3
1343+537	13:45:45.3552	+53:32:52.288	22	> 250	2	< 0.3

The source list ... *Continue*

	RA J2000 RA J2000	DEC J2000 DEC J2000	Freq (GHz)	Flux (mJy)	Int time (min)	Pos. Err (mas)
1348−289	13:51:46.8387	−29:12:17.650	22	> 250	2	< 0.3
1351−018	13:54:06.8953	−02:06:03.190	22	> 250	2	< 0.3
1352−104	13:54:46.5186	−10:41:02.656	22	> 250	2	< 0.3
1354+195	13:57:04.4366	+19:19:07.372	22	> 250	2	< 0.3
1405−287	14:08:49.6137	−29:00:23.608	22	> 250	2	< 0.3
1417+273	14:19:59.2970	+27:06:25.552	22	> 250	2	< 0.3
1436+373	14:38:53.6109	+37:10:35.416	22	> 250	2	< 0.3
1435−218	14:38:09.4693	−22:04:54.748	22	> 250	2	< 0.3
1441+522	14:43:02.7606	+52:01:37.298	22	> 250	2	< 0.3
1443−162	14:45:53.3762	−16:29:01.619	22	> 250	2	< 0.3
1444+175	14:46:35.3462	+17:21:07.581	22	> 250	2	< 0.3
1451−375	14:54:27.4097	−37:47:33.144	22	> 250	2	< 0.3
1459+480	15:00:48.6542	+47:51:15.538	22	> 250	2	< 0.3
1504+377	15:06:09.5299	+37:30:51.132	22	> 250	2	< 0.3
1508−055	15:10:53.5914	−05:43:07.417	22	> 250	2	< 0.3
1514+197	15:16:56.7961	+19:32:12.991	22	> 250	2	< 0.3
1514−241	15:17:41.8131	−24:22:19.476	22	> 250	2	< 0.3
1520+437	15:21:49.6138	+43:36:39.268	22	> 250	2	< 0.3
1519−273	15:22:37.6759	−27:30:10.785	22	> 250	2	< 0.3
1538+149	15:40:49.4915	+14:47:45.884	22	> 250	2	< 0.3
1548+056	15:50:35.2692	+05:27:10.448	22	> 250	2	< 0.3
1604+159	16:07:06.4304	+15:51:34.485	22	> 250	2	< 0.3
1606−398	16:10:21.8791	−39:58:58.328	22	> 250	2	< 0.3
1611+343	16:13:41.0642	+34:12:47.908	22	> 250	2	< 0.3
1622−253	16:25:46.8916	−25:27:38.326	22	> 250	2	< 0.3
1633+38	16:35:15.4929	+38:08:04.500	22	> 250	2	< 0.3
1640+254	16:42:40.4118	+25:23:07.682	22	> 250	2	< 0.3
3C345	16:42:58.8099	+39:48:36.993	22	> 250	2	< 0.3
1642+690	16:42:07.8485	+68:56:39.756	22	> 250	2	< 0.3
1639−062	16:42:02.1777	−06:21:23.695	22	> 250	2	< 0.3
1647−296	16:50:39.5441	−29:43:46.954	22	> 250	2	< 0.3
1651+312	16:53:29.9106	+31:07:56.872	22	> 250	2	< 0.3
DA426	16:53:52.2166	+39:45:36.608	22	> 250	2	< 0.3
1657−261	17:00:53.1540	−26:10:51.725	22	> 250	2	< 0.3
1709−342	17:13:09.9415	−34:18:29.427	22	> 250	2	< 0.3
1725+123	17:28:07.0512	+12:15:39.485	22	> 250	2	< 0.3
1734+508	17:35:49.0051	+50:49:11.565	22	> 250	2	< 0.3
SGR-A	17:45:40.0360	−29:00:28.167	22	> 250	2	< 0.3
1749+701	17:48:32.8403	+70:05:50.768	22	> 250	2	< 0.3
1754+155	17:56:53.1021	+15:35:20.826	22	> 250	2	< 0.3
1800+440	18:01:32.3148	+44:04:21.900	22	> 250	2	< 0.3
1817−254	18:20:57.8486	−25:28:12.584	22	> 250	2	< 0.3
1823+568	18:24:07.0683	+56:51:01.490	22	> 250	2	< 0.3
1827+062	18:30:05.9398	+06:19:15.952	22	> 250	2	< 0.3
1829−106	18:32:20.8364	−10:35:11.200	22	> 250	2	< 0.3
1829−207	18:32:11.0465	−20:39:48.202	22	> 250	2	< 0.3
1846+326	18:48:34.3611	+32:44:00.139	22	> 250	2	< 0.3
1855+031	18:58:02.3528	+03:13:16.299	22	> 250	2	< 0.3
1928+154	19:30:52.7669	+15:32:34.427	22	> 250	2	< 0.3
1953−325	19:56:59.4552	−32:25:46.007	22	> 250	2	< 0.3
1954−388	19:57:59.8192	−38:45:06.355	22	> 250	2	< 0.3
1957−135	20:00:42.1451	−13:25:33.533	22	> 250	2	< 0.3
2000+472	20:02:10.4182	+47:25:28.773	22	> 250	2	< 0.3
2008+355	20:09:57.6377	+35:43:18.003	22	> 250	2	< 0.3
2010+723	20:09:52.3038	+72:29:19.350	22	> 250	2	< 0.3
2013+163	20:16:13.8600	+16:32:34.112	22	> 250	2	< 0.3
2021−330	20:24:35.5764	−32:53:35.911	22	> 250	2	< 0.3
2023+336	20:25:10.8421	+33:43:00.214	22	> 250	2	< 0.3
2029+121	20:31:54.9942	+12:19:41.340	22	> 250	2	< 0.3

The source list . . . *Continue*

	RA J2000 RA J2000	DEC J2000 DEC J2000	Freq (GHz)	Flux (mJy)	Int time (min)	Pos. Err (mas)
2047+098	20:49:45.8649	+10:03:14.398	22	> 250	2	< 0.3
2048+361	20:50:02.2846	+36:19:52.502	22	> 250	2	< 0.3
2049+175	20:51:35.5829	+17:43:36.900	22	> 250	2	< 0.3
2053−323	20:56:25.0702	−32:08:47.800	22	> 250	2	< 0.3
2054−377	20:57:41.6034	−37:34:02.990	22	> 250	2	< 0.3
2059+034	21:01:38.8341	+03:41:31.320	22	> 250	2	< 0.3
2058−297	21:01:01.6599	−29:33:27.836	22	> 250	2	< 0.3
2106+143	21:08:41.0321	+14:30:27.012	22	> 250	2	< 0.3
2107+353	21:09:31.8787	+35:32:57.597	22	> 250	2	< 0.3
2128−123	21:31:35.2617	−12:07:04.796	22	> 250	2	< 0.3
2135+508	21:37:00.9862	+51:01:36.129	22	> 250	2	< 0.3
2141+175	21:43:35.5445	+17:43:48.787	22	> 250	2	< 0.3
2143−156	21:46:22.9793	−15:25:43.885	22	> 250	2	< 0.3
2144+092	21:47:10.1629	+09:29:46.672	22	> 250	2	< 0.3
2153−008	21:56:14.7579	−00:37:04.594	22	> 250	2	< 0.3
2155+312	21:57:28.8238	+31:27:01.351	22	> 250	2	< 0.3
2155−152	21:58:06.2818	−15:01:09.327	22	> 250	2	< 0.3
2159+505	22:01:43.5372	+50:48:56.389	22	> 250	2	< 0.3
VR422201	22:02:43.2913	+42:16:39.979	22	> 250	2	< 0.3
2201+171	22:03:26.8936	+17:25:48.247	22	> 250	2	< 0.3
2201+315	22:03:14.9757	+31:45:38.269	22	> 250	2	< 0.3
2208+199	22:10:51.6524	+20:13:24.054	22	> 250	2	< 0.3
2208−137	22:11:24.0994	−13:28:09.724	22	> 250	2	< 0.3
2209+236	22:12:05.9663	+23:55:40.543	22	> 250	2	< 0.3
2210−257	22:13:02.4979	−25:29:30.080	22	> 250	2	< 0.3
2214+241	22:17:00.8211	+24:21:45.957	22	> 250	2	< 0.3
2215+150	22:18:10.9139	+15:20:35.717	22	> 250	2	< 0.3
2223+210	22:25:38.0471	+21:18:06.414	22	> 250	2	< 0.3
2229+695	22:30:36.4697	+69:46:28.076	22	> 250	2	< 0.3
2227−136	22:30:15.3060	−13:25:42.901	22	> 250	2	< 0.3
2229+591	22:31:17.0754	+59:22:00.847	22	> 250	2	< 0.3
2234+282	22:36:22.4708	+28:28:57.413	22	> 250	2	< 0.3
2233−148	22:36:34.0871	−14:33:22.189	22	> 250	2	< 0.3
2240−260	22:43:26.4087	−25:44:30.688	22	> 250	2	< 0.3
2245−328	22:48:38.6857	−32:35:52.187	22	> 250	2	< 0.3
3C454.3	22:53:57.7479	+16:08:53.560	22	> 250	2	< 0.3
2250+194	22:53:07.3691	+19:42:34.628	22	> 250	2	< 0.3
2251+134	22:54:21.0162	+13:41:48.675	22	> 250	2	< 0.3
2253+417	22:55:36.7078	+42:02:52.532	22	> 250	2	< 0.3
2254−204	22:56:41.2077	−20:11:40.509	22	> 250	2	< 0.3
2258−022	23:01:07.9784	−01:58:04.585	22	> 250	2	< 0.3
2300−189	23:03:02.9759	−18:41:25.822	22	> 250	2	< 0.3
2308+341	23:11:05.3287	+34:25:10.905	22	> 250	2	< 0.3
2312−319	23:14:48.5005	−31:38:39.526	22	> 250	2	< 0.3
2320−035	23:23:31.9537	−03:17:05.023	22	> 250	2	< 0.3
2328+107	23:30:40.8522	+11:00:18.709	22	> 250	2	< 0.3
2327+335	23:30:13.7376	+33:48:36.471	22	> 250	2	< 0.3
2331−240	23:33:55.2378	−23:43:40.658	22	> 250	2	< 0.3
2331+073	23:34:12.8281	+07:36:27.551	22	> 250	2	< 0.3
2332−017	23:35:20.4120	−01:31:09.591	22	> 250	2	< 0.3
2335−027	23:37:57.3390	−02:30:57.629	22	> 250	2	< 0.3
2337−123	23:39:47.0435	−12:06:45.837	22	> 250	2	< 0.3
2342−161	23:45:12.4623	−15:55:07.834	22	> 250	2	< 0.3
2344+798	23:46:25.6090	+80:07:55.239	22	> 250	2	< 0.3
2346+385	23:49:20.8265	+38:49:17.558	22	> 250	2	< 0.3
2351+456	23:54:21.6802	+45:53:04.236	22	> 250	2	< 0.3
2351−154	23:54:30.1951	−15:13:11.212	22	> 250	2	< 0.3
2355−106	23:58:10.8824	−10:20:08.611	22	> 250	2	< 0.3
2357−318	23:59:35.4915	−31:33:43.824	22	> 250	2	< 0.3

Where the KVN is located?

1 Introduction

Despite the KVN is observing for 9 years, we still do not know its precise positions up to now. GNSS technique cannot measure position of the reference VLBI point that is a projection of the moving elevation axis onto the unmovable azimuthal axis. Potentially, a dedicated local survey can measure the offset between the VLBI and GPS reference points with accuracy 1–2 cm, but this needs to be done very accurately, requires significant efforts, and always a question arises is there any blunder in local survey ties that may cause a significant bias in reported position of the VLBI reference point.

There are KVN+VERA geodetic observations, presumably once per month. Unfortunately, these data turned out not very usable for two reasons.

First, there is no web site where one could download KVN+VERA data. I requested some time ago the data from NAOJ, and I got them, but in a form of a big box of dvd disks. A new problem emerged what to do with these disks? Just reading these disks turned out a huge problem that we failed to solve. I found a vintage DVD reader, but it reads optical disks extremely slow and with errors. Was that the problem of the disks themselves or the vintage DVD drive, remained unclear. I found colleagues who promised to read the DVD disks, give them the box of disks, but eventually I lost the track where the disks are.

The second problem is more serious: VERA stations were affected by the Tohoku earthquake. Positions of KVN stations in the KVN+VERA network are unreliable, since VERA stations taken as a reference for such observations exhibit significant non-linear motion. So, even if somebody will mange to solve a problem of reading vintage disks, we still face a challenge of deriving stable positions of KVN stations using observations at an unstable network.

We included BADARY and KVN in our 2018A EAVN project "Asian VLBI Galactic Plane Survey". If the observations would have run well, analysis of these observations would have solved the problem. Unfortunately, this project failed. KVNTN, KVNUS observed LCP, VERA+TIANMA65 observed RCP, KVNYS did not participated, baselines with BADARY and other non-KVN stations got fringes only in odd IFs. Although the astronomical part of that proposal for improving sources positions was partly successfully, the geodetic part of the project is a total loss. Basically, we propose to re-observe that session taking into account lessons learned and concentrate on he geodetic part, because lack of precise coordinates of KVN stations puts on hold astrometry programs. For nine years.

2 Proposed observations

Network KVN+URUMQI+TIANMA64+BADARY is good for determination of KVN positions. As a precaution, we add ZELENCHK, since URUMQI at 22 GHz is still considered for a shared risk. In a nutshell, a geometry of stations lined out along a straight line is poor since a projection of the baseline vector perpendicular to that direction is determined purely. The geometry is considered the strongest if the target station are uniformly surrounded by reference stations.

BADARY and ZELENCHK, although are not an official EAVN members, make the network significantly stronger than KVN+URUMQI+TIANMA65. VERA stations, except perhaps VERAOGSW, are considered as a target in the context of this project. We propose to observe at K-band with 16 IFs of 16 MHz each spread over 512 MHz bandwidth with a step of 16 MHz. The experiments will be scheduled using a geodetic strategy used for AOV or R1 IVS experiments. Each source will be observed for 2 min. We will use the pool of 297 strong sources observed in prior K-band surveys (Lanyi et al. 2010, Petrov et al. 2011) that are brighter than 250 mJy.

We proposed experiment as commissioning the EAVN for absolute astrometry and geodesy.

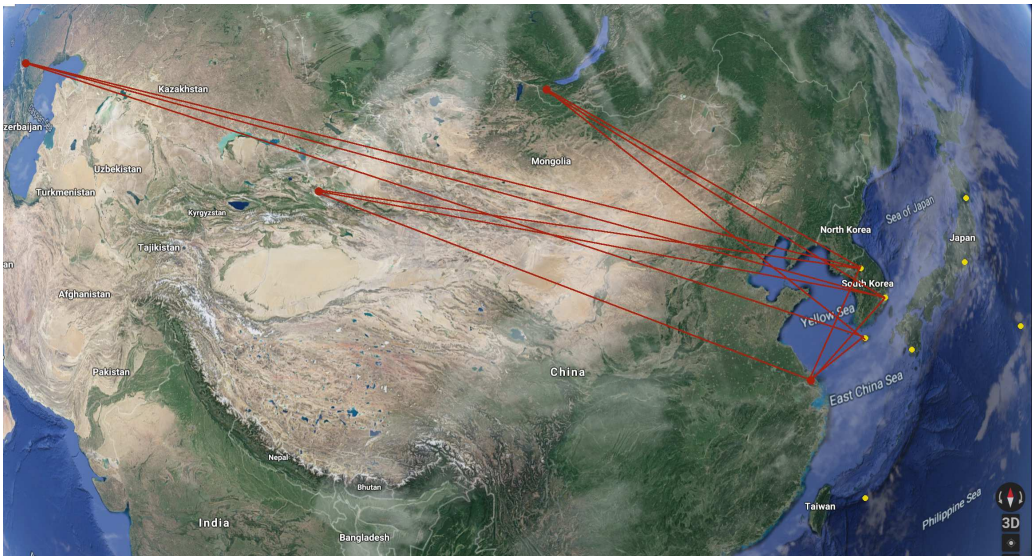

Figure 1: Proposed EAVN network. Reference stations are shown with red color. Target stations are shown with yellow color.

3 Risk mitigation

Considering that the previous experiment failed, we propose the following steps for risk mitigation:

1. First to run a 5 minute long fringe test at all stations.
2. Upon successful fringe test, to run a 6 hour long trial observing session. The goal of that observing session is to search for possible problems.
3. Upon a successful 6 hour long session we propose a 24 hour observing session.
4. We propose the KVN to record both RCP and LCP. Then a mistake in polarization labeling can be easily fixed during analysis. Additional bonus: we will make a rough estimate of polarization leakage of EAVN antennas at K-band.
5. We propose an extra station ZELENCHK for a case if URUMQI might fail.

4 Expected significance of proposed observations

We expect to get positions of KVN stations with sub-centimeter level of accuracy. Stations BADARY, ZELENCHK, URUMQI, and TIANMA65 will anchor the KVN to the VLBI coordinate system and the ITRF. This will allow to process a backlog of previous KVN survey experiments and enable running absolute astrometry experiments with the EAVN and KVN.

We waive proprietary period. Results of data analysis will appear on the Web within 24 hour of its completion.

References

Lanyi, G. E., et al., 2010, AJ, 139, 1695.
Petrov, L., 2011, AJ, 142, 35.
Petrov, L., et al, 2012, AJ, 144, 150.

Technical justification for "Where the KVN is located?" project

We propose to observe at 22 GHz at 16×0.016 GHz mode with 16 IFs spread over 0.512 GHz. The central frequency is selected to have the best sensitivity.

We propose the KVN stations in to record at both RCP and LCP to reduce a risk of failure due to an error in determining which cable brings LCP and which RCP. Other stations records RCP.

The source list attached in the cover page lists the pool of sources. Specific sources picked up for scheduling from this pool will be selected by the automatic scheduling procedure.