VLA Q-band proposal statistics over four semesters (2021A-2022B)

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ABSTRACT

In the context of trying to predict the likely usage of ALMA Band 1, this document briefly summarizes the VLA Q-band proposal statistics over the four semesters 2021A through 2022B. There were 123 proposals under consideration for a total of 2037 requested hours. Statistics below are based on requested, not allocated, observing time.

Observing modes (see Table 1, below):

- The most requested observing mode was continuum mode (with or without polarimetry); 75% of proposals requested a continuum mode, and 60% of all requested Q band hours were for continuum.
- The spectroscopy observing mode was requested in 38% of proposals, and 48% of requested hours were to do spectroscopy. Spectroscopic mode proposals were generally more expensive than continuum ones (on average, 21 hrs/proposal compared to 10-13 hrs/proposal for continuum, polarimetry, and mixed mode).
- Only 14% of proposals requested mixed modes (i.e., to do both continuum and spectroscopy), for 8% of the requested hours.
- Polarimetry was requested in 13% of proposals for 10% of the requested hours. The vast majority of these proposals requested polarimetry in conjunction with continuum observations (i.e., only 1 out of 16 polarimetry proposals requested polarimetry in conjunction with spectroscopy).

	N_proposals	Requested hours	Fraction (N_proposals)	Fraction (hours)	Average hrs/proposal
Continuum	92	1222	0.75	0.60	13.3
Spectroscopy	47	983	0.38	0.48	20.9
Mixed (cont + spectroscopy)	17	172	0.14	0.08	10.1
Polarimetry (any)	16	202	0.13	0.10	12.6
All proposals	123	2037	1	1	16.6

Scientific categories (Table 2, below):

- The most proposed scientific category was Star Formation (40% of proposals, for 35% of the requested Q band hours). All other scientific areas requested Q band in 15% or fewer proposals (top three areas after star formation: AGN, high redshift/source surveys, and solar system/stars/planetary systems).
    - These areas, and the radio-literate folks in them, are also heavily proposed at ALMA so it's reasonable to expect that they will be future users of Band 1.
- A rough translation of proposals into the ALMA scientific categories suggests that roughly half of the submitted proposals would go to Category 3 (ISM), a third to Categories 1/2 (galaxies), and the remainder (less than 20%) to Categories 4/5.
- Galaxies proposals (Categories 1/2, in particular the high redshift and extragalactic structure proposals) were the most expensive on average, with 22 hrs/proposal compared to 12-14 hrs/proposal for Categories 3/4/5.

	N_proposals	Requested hours	Fraction (N_proposals)	Fraction (hours)	Average hrs/proposal
VLA CATEGORY					
Active Galactic Nuclei	19	268	0.15	0.13	14.1
Extragalactic Structure	3	248	0.02	0.12	82.5
Gravitational Waves and Energetic Transients	4	37	0.03	0.02	9.2
High Redshift and Source Surveys	17	390	0.14	0.19	23.0
Interstellar Medium	7	59	0.06	0.03	8.4
Normal Galaxies, Groups, and Clusters	6	95	0.05	0.05	15.8
Pulsars and Compact Objects	2	8	0.02	0.00	4.0
Solar System, Stars, Planetary Systems	16	222	0.13	0.11	13.9
Star Formation	49	711	0.40	0.35	14.5
APPROXIMATE ALMA CATEGORY					
Category 1/2	45	1000	0.37	0.49	22.2
Category 3	56	770	0.46	0.38	13.7
Category 4/5	22	267	0.18	0.13	12.1
All proposals	123	2037	1	1	16.6

Configuration (Table 3, below):

- The longest baseline configuration (A array, 32% of proposals) was slightly more heavily requested than the other configurations. The other three configurations, and "Any Configuration", were each requested in 11-20% of proposals.
- D-array proposals were the most expensive on average, at 27 hrs/proposal compared to 13-16 hrs/proposal for the A/B/C/Any configurations.

	N_proposals	Requested hours	Fraction (N_proposals)	Fraction (hours)	Average hrs/proposal
Any configuration	13	196	0.11	0.10	15.1
A	39	492	0.32	0.24	12.6
B	25	400	0.20	0.20	16.0
C	21	287	0.17	0.14	13.7
D	25	662	0.20	0.33	26.5
All proposals	123	2037	1	1	16.6