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Completing the K-band Celestial Reference Frame in the North.

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K-band (22 GHz) radio observations have the potential to form the basis for the most accurate celestial reference frame ever constructed. Relative to the standard S/X (2.3/8.4 GHz) observing bands, K-band is expected to exhibit a reduction in extended source morphology and core-shift. This reduction in astrophysical systematics should allow for a more stable celestial reference frame at K-band and should also be advantageous in tying the VLBI radio frame to the Gaia optical frame. The current K-band catalogue consists of only 274 sources from a few VLBA sessions and uncertainties in source positions at the ˜100 micro-arcsecond level. Modern 2 Gbps data rates are 16 times better than previous observations, yielding a four fold increase in sensitivity. Southern observations to reduce astrometric systematics and to complete the sky coverage at K-band are under way. However, new astrometric and imaging observations are also required in the North to improve K-band precision and spatial coverage, and to map the intrinsic source structure so that their astrometric quality can be evaluated. A proposal for astrometric and imaging observations using the Very Long Baseline Array (VLBA) at K-band have been approved. We discuss some of our first results from our K-band VLBA campaign.

Primary author: Dr DE WITT, Aletha (Hartebeesthoek Radio Astronomy Observatory)

Co-authors: Dr BERTARINI, Alessandra (Max Planck Institut fu¨r Radioastronomie); Mr JACOBS, Christopher (JPL/NASA); Dr BOURDA, Geraldine (Laboratoire d'Astrophysique de Bordeaux); Dr MCCALLUM, Jamie (University of Tasmania); Dr LOVELL, Jim (University of Tasmania); Dr QUICK, Jonathan (HartRAO); Dr CHARLOT, Patrick (Laboratoire d'Astrophysique de Bordeaux); Dr HORIUCHI, Shinji (C.S.I.R.O/Canberra Deep Space Communications Complex)

Presenter: Dr DE WITT, Aletha (Hartebeesthoek Radio Astronomy Observatory)

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