Contribution ID: **58** Type: **Oral Presentation**

Source Structure Effect on Southern Hemisphere VLBI Reference Frame

Wednesday, 9 July 2014 14:20 (20 minutes)

Abstract content
   (Max 300 words)
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The International Celestial Reference Frame (ICRF) has been adopted by the International Astronomical Union (IAU) in 1997. The current standard, ICRF-2, is based on dual frequency 2.3- and 8.4-GHz VLBI radio observations of 3414 Active Galactic Nuclei (AGN). Extragalactic Radio sources which have been included in ICRF catalog are sources known to have compact source structure and are known as reference sources. An ideal reference source should have an accurate known position and be unresolved at the observed frequency. However, AGN can exhibit spatially extended strutrue that may vary both in time and frequency. This variability can introduce a significant error in the VLBI measurements thereby degrading the accuracy of the estimated source position. Reference source density in the Southern Hemisphere is poor compared to the Northern Hemisphere. One of the main reasons is the limited number of radio telescopes in the south. Another major problem is the few known reference sources in the Southern Hemisphere. Here we report on our effort to monitor the structural evolution of AGN sources in order to evaluate their suitability as reference source for future VLBI observations. Celestial Reference Frame Deep South (CRDS) is a campaign of the International VLBI Service of Geodesy and Astrometry (IVS), where radio telescopes from the Southern Hemisphere participate in astrometric VLBI sessions at 2.3- and 8.4-GHz. Another survey named the Long Baseline Array (LBA) Calibrator Survey (LCS) is also working to increase the reference source density in the Southern Hemisphere below -40 degree declination at 8.4-GHz. We use both LCS and CRDS sessions in our ongoing project.

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PhD

Main supervisor (name and email)
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Session Classification: Space

Track Classification: Track D1 - Astrophysics