The International VLBI Service for Geodesy and Astrometry – Status and Prospects

Rüdiger Haas
Chalmers University of Technology, SE-439 92 Onsala Space Observatory, Sweden

The International VLBI Service for Geodesy and Astrometry (IVS) is one of four services of the International Association for Geodesy (IAG) that collaborate and contribute as technique centers to the efforts of the International Earth Rotation and Reference Systems Service (IERS). Important products that arise from this cooperative work are time series of Earth orientation parameters (EOP), as well as celestial and terrestrial reference frames (CRF, TRF). The different techniques have individual advantages and complement each other. In this context, VLBI is unique in providing the basis for the International Celestial Reference Frame (ICRF) as well as celestial pole offsets. Together with Laser Ranging VLBI provides the scale of the International Terrestrial Reference Frame (ITRF). All techniques contribute to polar motion observations, while VLBI in particular contributes to observations of the earth rotation angle.

In this presentation, the principles of geodetic VLBI will be described as well as the current status of the IVS and its prospects. The IVS is currently in a renewal phase and is introducing and rolling out the next generation geodetic VLBI system, called the VLBI Global Observing System (VGOS). Several agencies worldwide have already built VGOS stations, e.g. Yebes Observatory, or are in the process of doing so. VGOS makes use of relatively small and stiff radio telescopes that allow high speed motion in azimuth and elevation and thus many observations per time unit in many different directions on the sky. The VGOS receiving systems are broadband and can cover about 2–14 GHz in two polarizations and allow high data rates. Using this approach, the expectations are that VGOS will improve the performance of geodetic VLBI by one order of magnitude compared to the legacy VLBI system that has been operated since the 80ies. The current status of the IVS network, both legacy and VGOS, as well as examples of result derived will be presented.