



Impact of the galactic acceleration on the terrestrial reference frame and the scale factor in VLBI

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The relative motion of the solar system barycentre around the galactic centre can also be described as an acceleration of the solar system directed towards the centre of the Galaxy. So far, this effect has been omitted in the a priori modelling of the Very Long Baseline Interferometry (VLBI) observable. Therefore, it results in a systematic dipole proper motion (Secular Aberration Drift, SAD) of extragalactic radio sources building the celestial reference frame with a theoretical maximum magnitude of 5-7 microarcsec/year. In this work, we present our estimation of the SAD vector obtained within a global adjustment of the VLBI measurements (1979.0 – 2016.5) using the software VieVS. We focus on the influence of the observed radio sources with the maximum SAD effect on the terrestrial reference frame. We show that the scale factor from the VLBI measurements estimated for each source individually discloses a clear systematic aligned with the direction to the Galactic centre-anticentre. Therefore, the radio sources located near Galactic anticentre may cause a strong systematic effect, especially, in early VLBI years. For instance, radio source 0552+398 causes a difference up to 1 mm in the estimated baseline length. Furthermore, we discuss the scale factor estimated for each radio source after removal of the SAD systematic.