



## **Observations of the APOD satellite with the AuScope VLBI network**

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The Chinese APOD (Atmospheric density detection and Precise Orbit Determination) satellite, launched in September 2015, is the first LEO (Low Earth Orbit) satellite co-locating three space-geodetic techniques including VLBI. Being equipped with a dual-frequency GNSS receiver, an SLR retro-reflector and a VLBI beacon transmitting DOR tones in the S and X band it can be considered as a first prototype of a geodetic co-location satellite in space. With the focus on VLBI observations we present a series of experiments carried out by the AuScope geodetic VLBI array in November 2016. We describe all steps integrated in the established process chain: the experiment design and observation planning, the antenna control and satellite tracking scheme, the correlation and derivation of baseline delays. In the subsequent data analysis which includes - for the first time - the estimation of reasonable satellite orbit offsets in the Vienna VLBI and Satellite Software (VieVS) post-fit residuals on the decimeter-level were found. These experiments represent the first end-to-end realizations of VLBI observations of a tie satellite on a LEO orbit, and are a valuable resource for future more sophisticated space tie satellite missions such as GRASP or E-GRASP/Eratosthenes.