

From Relative to Absolute Antenna Phase Centre Calibration: The effect on the SINEX products

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Within the IGS, all the receiver antenna types being used were calibrated with respect to the Dorne Margolin (AOAD/M_T) model. There are some shortcomings with this approach (e.g.: deficient for long baselines, introduction of scale bias, satellite absolute phase centre cannot be accounted for properly). It was proposed at the last workshop to switch to absolute phase centre calibrations determined either from anechoic chamber results, robotic calibrations in the field, or from relative calibrations. Some calibrations include the effect of radomes. A test campaign was started last year to produce the weekly official IGS products using both relative and absolute calibrations in parallel. These weekly solutions were compared and analyzed. The effect on station coordinates was, as expected, mainly on the height (scale) component. On average, the height differences correspond to a scale change of about 2ppb, which brings the IGS “scale” closer to ITRF. Height differences at stations using the same type of antenna reach the cm level. Similar differences were also observed between different antenna types. The repeatability of the differences from week to week for each AC solutions was generally within ~2mm/~6mm(std) for the horizontal/vertical components. Some biases, sometimes exceeding 10mm, were observed between the ACs average shifts. When absolute phase centres are officially implemented, there will be a discontinuity at all stations. This may have a significant effect on the reference frame realization, the apparent geocenter and the ERP's.