



Variation Scenarios in System Deployments for the GGOS2020 Space Geodesy Network

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Simulation studies have so far determined an approximate size and station density for the Space Geodetic Network that will meet the requirements recommended by the U.S. National Research Council report “Precise Geodetic Infrastructure: National Requirements for a Shared Resource” (2010). A network of about ~30 globally distributed “core” observatories with state of the art equipment needs to be deployed over the next decade. Subsequently, GGOS—the Global Geodetic Observing System issued a “Call for Proposals for the expansion and update of the network, to which several countries committed to contribute. The renewal process will not happen instantly and for a long time, the network will comprise legacy and next generation equipment. We conducted a new batch of simulation studies using the proposed site locations and the proposed equipment at each site, to gauge the contribution of specific systems and locations to the global results. The majority of the examined sites are well-established future sites, some of which are even close to completion. Despite the good intentions of the contributing agencies/countries, in some cases we have identified regional gaps in coverage with either SLR or VLBI systems. We have characterized the effect of these gaps on the quality of the final TRF. We present the results of these simulation studies and rank the examined cases according to the likelihood that the designed network will successfully meet the GGOS goals of 1 mm accuracy (decadal scale) and a temporal stability on the order of 0.1 mm/y, with similar numbers for the scale and orientation components of the TRF.