REFAG 2022 THESSALONIKI - GREECE 17-20 October 2022

ITRF2020 seasonal geocenter motion model

Paul Rebischung (IGN / IPGP), Zuheir Altamimi (IGN / IPGP), Xavier Collilieux (IGN / IPGP), Laurent Métivier (IGN / IPGP) and Kristel Chanard (IGN / IPGP)

Abstract. The computation of the latest release of the International Terrestrial Reference Frame, ITRF2020, involved not only the combination of long-term, piece-wise linear coordinates from the four space geodetic techniques, but also, for the first time, of annual and semi-annual terms describing the seasonal displacements of the geodetic stations. The origin of these seasonal terms was defined in such way that there is no seasonal translation between them and the input Satellite Laser Ranging (SLR) solutions. The seasonal terms stemming from the ITRF2020 combination are thus expressed with respect to the Earth's center of mass (CM), as sensed by SLR.

If integrated over the Earth's surface, the field of seasonal surface deformation with respect to CM gives access to seasonal geocenter motion, i.e., the seasonal motion of the Earth's center of figure (CF) with respect to CM. Taking advantage of the dense network of GNSS stations in ITRF2020, it was thus possible to estimate seasonal geocenter motion from the field of ITRF2020 seasonal terms. This presentation describes the procedure which was followed to obtain the final ITRF2020 seasonal geocenter motion model. This model is then compared with other recent estimates of seasonal geocenter motion.