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Combination strategies for the realization of an Epoch Reference Frame for South America

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Conventional long-term Terrestrial Reference Frames (TRF) based on station positions and velocities suffer from the fact that they are outdated from the moment of their realisation (publication). Especially in regions with high seismic activities, their usability is often limited to a very short period of time. Moreover, the geocentricity of the TRF, i.e. its origin defined to coincide with the Earth's centre-of-mass as well as its scale defined to be equal to the common SLR and VLBI scale, is not ensured over time. Regional reference frames like SIRGAS (Sistema de Referencia Geocéntrico para las Américas), on the other hand, are usually realised solely by densifying the global conventional TRF via fiducial points; thus, also the geocentricity of the densified TRF is only given at a certain point of time.
Within the DFG-funded project DIrect GEocentric Realisation of the American reference frame by combination of geodetic observation TechnIques (DIGERATI), investigations with respect to the realisation of an Epoch Reference Frame (ERF) are being performed. The ERF shall be realised directly and geocentrically, i.e. from a global station network, being densified for the South American subcontinent. The investigations are focussed on the optimum combination strategies of the geodetic techniques as well as on the optimum "sampling" of realisations (e.g. monthly) in order to obtain a sufficient amount of observations in each ERF realisation. The results are compared to the current conventional realisation.