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Determination of geocenter secular motion

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Mass redistributions within the Earth induce displacements of the center of mass with respect to the center of figure of the Earth (geocenter motion). Recent studies have shown that knowing the secular geocenter motion may be useful to constrain geophysical observations such as recent ice melting or postglacial rebound. In this work, we investigate the long term geocenter velocity. We, first, show that the classical method to infer the Center of Figure of the Earth is not appropriate and we propose a new formulation for the geocenter motion slightly different form the original one. Then, in the framework of ITRF2008 preparation, we examine Satellite Laser Ranging solutions, provided by the International Laser Ranging Service (ILRS), which are particularly sensitive to the center of mass position. We also analyse a few GPS solutions provided by analysis centers of the International GNSS Service (IGS).