Benoit
Meyssignac
CNES/LEGOS
Olivier Henry,
Hindumathi Palanisamy,
Anny Cazenave,
C. K. Shum
Poster
For the past decades, information about sea level is sparse and essentially based on tide gauge records along islands and continental coastlines. This dataset cannot alone inform on open ocean regional variability. But it is important to know the dominant modes of the global and regional sea level variability on interannual/decadal/multidecadal time scales in order to understand the physical processes which drive them. For this purpose, several two-dimensional (2-D) past sea level reconstructions over the last century have been developed (e.g., Chambers et al., 2002a, b, Church et al., 2004, Berge-Nguyen et al., 2008, Llovel et al., 2009, Church and White, 2011, Calafat et al. 2010, Meyssignac et al., 2011, 2012, Ray and Douglas, 2011, Hamlington et al., 2011). In this presentation we use the Empirical Orthogonal Function –EOF- approach to reconstruct past sea level. This approach uses EOFs to combine long tide gauge records of limited spatial coverage and 2-D sea level patterns based on the altimetry dataset or on runs from Ocean General Circulation Models (OGCM). We developed 5 past sea level reconstructions based on EOFs from OGCMs with data assimilation, 2 reconstructions based on EOFs from OGCMs without data assimilation and 1 reconstruction based EOFs from satellite altimetry. Compared to previous reconstructions in the literature these reconstructions use data corrected for glacial isostatic adjustment (both tide gauge records and Altimetry) and tide gauge records corrected for vertical crustal motion with GPS measurements when available. The 8 reconstructions are based on more than 400 tide gauge records and cover the period 1900-2012 on a monthly basis. Performances of the 8 reconstructions are discussed in comparison with independent tide gauges not used in the reconstruction process. We also discuss the differences between the different reconstructions in terms of global mean sea level over the period 1900-2012 and in terms of sea level trend patterns over the period 1950-2012. Then, we present a ‘mean’ reconstruction based on the ensemble average of the 8 individual reconstructions. The dominant modes of temporal variability and the spatial trend patterns of this mean reconstruction are discussed.
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