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## Characterisation of the chaotic variability of the regional sea level and its components over 1993-2015 at interannual time scales

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Satellite altimetry data have revealed a global mean sea level rise of 3.1 mm/yr since 1993 with large regional sea level trend variability. These remote data highlight complex structures especially in strongly eddying regions. A recent study showed that over 38% of the global ocean area, the chaotic variability that spontaneously emerges from the ocean may hinder the attribution to the atmospheric forcing of regional sea level trends from 1993 to 2015. This study aims at complementing this work by first focusing on the atmospherically-forced and chaotic contributions of regional sea level interannual variability and its components (steric and manometric sea level interannual variability). A global  $\frac{1}{4}^\circ$  ocean/sea-ice 50-member ensemble simulation is considered to disentangle the imprints of the atmospheric forcing and of the chaotic ocean variability over 1993-2015. The atmospherically-forced and chaotic interannual variabilities of sea level mainly have a steric origin, except in coastal areas. The chaotic part of the interannual variability of sea level and its components is stronger in the Pacific and Atlantic oceans than in the Indian ocean. The chaotic part of the interannual variability of sea level and of its steric component exceeds 20% over 48% of the global ocean area; this fractional area reduces to 26% for the manometric component. As the chaotic part of the regional sea level interannual variability has a substantial imprint, this study then interested in quantifying the periods when it becomes dominant over the atmospherically-forced contribution. This is assessed using spectral analysis on the ensemble simulation in the frequency domain for the sea level and its steric and manometric components over the global ocean as well as in some basins of interest. This enables us to better characterise and quantify the chaotic ocean variability contribution to regional sea level changes and its components.