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Continental water mass variations from Independent Component Analysis (ICA) of Level-2 monthly GRACE data

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An approach based on Independent Component Analysis (ICA) has been applied on a combination of monthly GRACE satellite solutions computed from official providers (UTCSR, JPL and GFZ), to unravel geophysical signals from important striping undulations. As the non-gaussianity condition for input 300, 400, 500-km pre-filtered GRACE signals is valid, this linear inverse approach ensures to separate components which are statistically independent. A previous study on one month of data showed that the most energetic component found by ICA corresponds mainly to continental water mass change. Series of ICA-estimated global maps of continental water storage have been produced over 08/2002-07/2009 and compared with the ones obtained using other post-processings, such as destriping and Gaussian filtering. We also computed and analyzed time series of water mass averages for the major drainage basins of the world and estimated their corresponding contribution to sea level variations.