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Energy of the semidiurnal internal tide from Argo data compared with theory

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A global map of the amplitude of the semidiurnal internal tide at the 1000 dbar level, obtained from Argo park-phase data, is converted to depth-integrated energy density. As opposed to current satellite altimeter data, the high sampling rate of the floats enables the direct observation of the total wave field, including waves with a time varying phase difference to the astronomical forcing. Thus, the Argo-derived energy content is only affected by mixing, scattering, and nonlinear processes. The Argo data alone do not allow for retrieving the distribution of the energy over the different vertical modes. Nevertheless, the modal partitioning of the Argo-derived energy content is inferred from other datasets. The results are compared with a geographical distribution of the internal tide energy content estimated with a Lagrangian ray tracing model. The outcome is in turn used to tune the modelled attenuation of low-mode internal tides.