



The sea level fingerprint of 21st Century ice mass loss

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The sea level contribution from glacial sources has been accelerating during the 21st Century. This contribution is not distributed uniformly across the world's oceans due to both oceanographic and gravitational effects. We compute the sea level signature of 21st Century ice mass fluxes due to changes in the gravity field and Earth's rotation. Mass loss from Greenland results in a relative sea level (RSL) reduction for much of North Western Europe and Eastern Canada. RSL rise from this source is concentrated around South America. Losses in West Antarctica marginally compensate for this and produce maxima along the coastlines of North America, Australia and Oceania. The combined far-field pattern of wastage from all ice melt sources, is dominated by losses from the ice sheets and results in maxima at latitudes between $\pm 40^\circ$ across the Pacific and Indian Oceans, affecting particularly vulnerable land masses in Oceania. The spatial pattern of RSL variations due to the observed ice mass loss is temporally invariant. Thus, sea level rise from the present-day distribution of ice loss will be amplified for this sensitive region.