# 東南極における酸素同位体ステージ 3 と完新世の海水準変動

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# Marine Isotope Stage 3 and Holocene relative sea level variations in East Antarctica derived from glacial isostatic adjustment modelling

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We present relative sea level (RSL) curves in Antarctica derived from glacial isostatic adjustment (GIA) predictions based on the melting scenarios of the Antarctic Ice Sheet (AIS) during the last glacial cycle given in previous works (e.g., Nakada et al., 2000, Ivins and James, 2005). Simultaneously, Holocene-age RSL observations obtained at the raised beaches along the coast of Antarctica are shown to be in agreement with the GIA predictions. The differences from previously published ice loading models regarding the spatial distribution and total mass change of the removed ice are significant. These models were also derived from GIA modelling; the variations can be attributed to the lack of geological and geographical evidence regarding the history of crustal movement due to ice sheet evolution. Next, we summarise the previously published ice load models and demonstrate the RSL curves based on combinations of typical ice and earth models. The RSL curves calculated by GIA indicate that the model dependence of both the ice and earth models is significantly large at several sites where RSL observations were obtained. However, our predictions strongly suggest that it is possible to find the average ice model despite the use of the elastic thickness models, which vary in their appropriate range.
On the other hand, detailed RSL observations around Syowa indicate the existence of a sea-level highstand of about 10 m around 40 kyr BP (Miura et al., 1998). In addition to this, Hodgson et al. (2009) reported that the marine and lake sediments which ages are about 30 kyr BP are found at same level of Holocene bench in the Larsemann Hills, Lambert Glacier region. These observations imply that RSLs at Marine Isotope Stage 3 are higher than the present sea level and the crustal rebound are triggered by the melting of East Antarctic Ice Sheet at about 40-30 kyr BP. To investigate these sea level observations, we have performed preliminary numerical calculations. In this study, we compare between these observations and GIA predictions and suggest the appropriate model of ice volume history of AIS during the last glacial cycle.

**References**

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