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## **Importance of landfast ice for ice shelves melt rate projection under future climate conditions in the Totten area, East Antarctica**

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The Totten Glacier in East Antarctica is of major climate interest because of the large fluctuation of its grounding line and of its potential vulnerability to climate change. The Totten ice shelf melt rate is predicted to increase under future climate conditions, but this increase may differ on whether the landfast ice is represented in the model or not. Using a series of high-resolution, regional NEMO-LIM-based experiments, including an explicit treatment of ocean – ice shelf interactions and a landfast ice representation, we simulate the ocean – ice interactions in the Totten Glacier area for both historical (1995-2014) and future (end of the 21<sup>st</sup> following RCP 4.5) periods. We show major changes between historical and projection runs as increased ice shelf melt rate, loss in sea ice production or intensified ocean circulation. Moreover, the representation of landfast ice dampens the ice shelf melt rate increase. The Totten ice shelf melt rate is increased between the two periods by either +41% when landfast ice is taken into account, or by 58% when it is not taken into account. This highlights the importance of including a landfast ice representation in our ocean models in order to predict realistic ice shelf melt rate increase in East Antarctica.