



## **The multitude of feedbacks between Antarctica's Ice and the Southern Ocean**

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Studying the vulnerability of Antarctic Ice Shelves and Sheets to changes in the Southern Ocean has experienced increased attention in the last decade. Aiming to deepen the understanding of the interaction between sea ice production, ocean circulation and heat transport underneath Antarctic Ice Shelves we summarize results of different numerical experiments and present first glimpses from a circum-Antarctic ice sheet coupled ocean model.

Overall results so far suggest that a dwindling sea ice production can temporarily reduce ocean driven deep ice shelf melting. Secondly stronger wind events may slow down the circulation over the Antarctic continental shelves and thus reduce heat transport where geostrophic flows appear driven by horizontal density gradients induced through sea ice formation. Furthermore changes in the physical shape of floating glacier tongues and small ice shelves can substantially alter regional circulation behaviour and influence the ocean connectivity of much larger neighbouring ice shelves.