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Reaching the 1.5 degree limit: what does it mean for West Antarctica and the global mean sea level?

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What are the benefits of limiting the global warming to 1.5 degree with respect to pre-industrial conditions for the vulnerable region of West Antarctica which might be prone to positive feedback mechanisms between ocean circulation, melting of shelf ice and instabilities of the ice sheet? There are indications that West Antarctic ice sheet instabilities have occurred in the Last Interglacial around 125.000 years ago. At that time the polar surface temperature was about 2°C warmer than today. The question under which circumstances a tipping point may be reached and if this may happen again is therefore highly relevant, especially since a disintegration of the West Antarctic ice sheet could cause a global sea level rise between 3 and 5 m. Here we address this question with variable resolution, global coupled ice sheet - shelf ice - ocean - atmosphere multi-century simulations. With our innovative ocean modelling approach in the Finite Element Sea-ice Ocean Model FESOM it is possible to refine the ocean resolution to up to 3 km in the Amundsen Sea and 10 km around the whole Antarctica while keeping it relatively coarse in the order of a couple of hundred km in dynamically not very active regions such as the subtropical regions. This means that we can simulate the feedback between ocean and ice in the relevant regions highly resolved given that the ice sheet model runs at a resolution of 5 to 10 km. Three different emission scenarios are applied up to 2100, two of them limiting the global mean temperature increase to 1.5°C and 2°C respectively and one of them assuming business-as-usual conditions (IPCC SRES RCP8.5 scenario). The simulations are extended to 2400 with the greenhouse gas and aerosol concentrations kept constant at 2100 levels, respectively, to be able to simulate the long-term implications of different global warming levels.