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Decadal prediction experiments over a local Southern Ocean configuration

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The climate of polar regions is characterized by large fluctuations and has recently experienced dramatic changes. In the Antarctic, some regions have warmed less than the global average with some sea ice advance, in particular in the Ross Sea, while other regions have warmed significantly and displayed sea ice loss. While the ability to predict decadal climate variations has been confirmed in various parts of the world, polar regions have been given little attention so far, mostly because in these areas, observational data is sparse and global climate models suffer from systematic biases. Moreover, the Antarctic climate has been shown to strongly depend on complex feedback mechanisms between several distinct components (atmosphere, ocean circulation, sea ice, ice sheets...). Finally, global climate models involved in current decadal prediction experiments run at a rather coarse ($\sim 1^\circ$) resolution and are therefore likely missing a whole variety of processes holding predictability. Therefore, advancing decadal predictions in the polar regions is only possible if the coupling of the climate components is properly taken into account, and if cutting-edge models are used on local configurations, allowing higher resolution ($\sim 1/4^\circ$), while making full use of the ever-increasing observational data base at the disposal of the community. This poster presents a new coupled Southern Ocean model configuration that aims at fulfilling the conditions described above, along with first results. Our configuration uses NEMO-LIM for the ocean (including sea ice), COSMO-CLM for the atmosphere and f.ETISh for the marine ice sheets.