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Antarctic Subglacial Processes and Interactions: the role of transition zones in ice sheet stability

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The aim of **ASPI** (Antarctic Subglacial Processes and Interactions) is (i) to understand the interactions between the ice sheet and the subglacial environment and the processes that control the Antarctic ice sheet, and (ii) to quantitatively determine the stability of the ice sheet in a changing climate and the impact of climatic variations on the coastal ice sheet. A key factor in such quantification and impact assessment is the existence of transition zones within the ice sheet. Such transition zones are examples of specific boundary layers widely found in glaciology. Basically they are parts of the ice sheet which overlie basal transition zones where the flow is anomalous. Typical examples of such transition zones are the grounding lines, i.e. the interface between the ice sheet and an ice shelf, between an ice sheet and a subglacial lake, as well as between an ice shelf and its pinning points. These transition zones are probably among the least understood elements of ice sheets, although they determine to a large extent the processes and dynamics of lateral expansion and retreat of ice sheets as well as the stability of marine ice sheets.

ASPI seeks to investigate (i) the processes responsible for grounding line migration in marine ice sheets (present and future behaviour), (ii) the effect of marine ice formation on the rheology and ice viscosity of the transition zone, hence the stability of ice shelves, (iii) the stability of subglacial lakes over longer time spans, and (iv) basal processes and interactions in order to unravel the paleoclimatic signal in deep ice cores.