Effects and feedbacks of the basal sliding parameter on ice and water flow beneath an ice-stream

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Relatively short timescale elevation anomalies - on the order of 2 to 3 years - observed in a number of locations along west Antarctic ice-streams are interpreted as being subglacial ponds filling or draining in response to subglacial hydrologic conditions. We hypothesize that the ponds' formation is associated with response to local variations in basal traction that has a dual effect on the subglacial water. On the one hand, locations with high basal traction act as a source of melt water, on the other hand, variations in the basal traction affect ice flow and its thickness, these in their turn determine locations of water ponding. We investigate how the ice and water flow may affect one another when treated as a coupled system. Here we present the results of work in which the effect of varying the basal sliding parameter is investigated relative to the flow and distribution of subglacial water as well as the potential feedbacks that could be created in the coupled system.