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The ISMIP-HOM benchmark experiments performed using the finite-element code Elmer

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The aim of this presentation is to describe in detail how the benchmark tests ISMIP-HOM (Ice Sheet Model Intercomparison Project - Higher-Order ice-sheet Model, *http://homepages.vub.ac.be/∼fpattyn/ismip/welcome.html*) has been performed using the Open-Source Finite Element (FE) code Elmer (*http://www.csc.fi/elmer*). The ISMIP-HOM setup consists of five diagnostic and one prognostic experiments, for both 2D and 3D geometries. All these tests have been solved using a full-Stokes FE model. FE technical points, such as the mesh characteristics, the stabilization methods, the numerical methods used to solve the linear system and parallel computations are discussed. For all these comparisons, the CPU time consumption is analyzed in comparison to the accuracy of the solution. Some general rules are then inferred that optimize the computing time versus the accuracy of the results.