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Sector Collapse Episode at Kick 'em Jenny Volcano, Lesser Antilles Arc

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Kick 'em Jenny volcano (KeJ), the only submarine volcano of the current active Lesser Antilles, lies in a horseshoe-shape structure. The March 2003 and 2005 research cruises aboard Ronald H. Brown vessel (Lindsay et al., 2003; Lindsay et al., 2005) confirmed its existence and identified several debris avalanches deposits. This study focuses on what is believed to be the youngest large avalanche deposit, hereafter referred to as the Main Debris Avalanche (MDAD). Considering a flat bottom surface we estimated MDAD volume to be 4.4 $\pm$ 1.4 km3 with two zones of maximum thickness of ca. 330 m. This volume is the same order of magnitude as other documented debris avalanche deposits originating on land in the region. Reconstructing the pre-collapse edifice from MDAD estimate and bathymetric data, we then modelled the mass flow using VolcFlow, a numerical package using depth-averaged integrated mass and momentum equations. In addition to evaluating first order parameters that may have controlled the mass flow, we tested different rheological laws, different configurations of edifice and different bottom surfaces to help reproducing MDAD. Finally, we investigated the tsunamigenic potential of such mass flow onto the coast of Guadeloupe by using the Boussinesq equation-based GeoWave.