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Cosmogenic 3He exposure dating of the Quaternary lavas at Fogo, Cape Verde Islands

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Determining the chronology of young volcanic ocean islands is important given the infrequent yet destructive nature of volcano flank collapse. Conventional dating techniques (Ar/Ar and 14C) of Quaternary basaltic volcanism are often limited in applicability by the suitability of material. The high production rate of cosmogenic 3He, and the good availability of appropriate minerals (olivine and pyroxene) in the basaltic lava flows, means exposure dating provides an alternative where erosion rates are low. Here we present results from an ongoing study to date the Monte Amarelo flank collapse of Fogo, Cape Verdes. We are attempting to bracket the timing of collapse by dating lava flows that erupted prior to and following the collapse. In addition, we sampled syn-collapse ejecta deposits in the form of pyroxenite blocks, erupted from vents associated with the collapse. Preliminary results on samples from the first pre-collapse flow yield exposure ages of ˜125ka. Exposure ages of the first post-collapse flow dated so far yield exposure ages of ˜11ka. Exposure ages of the syn collapse blocks are younger at ˜7ka, which probably is the result from shielding by post-depositional burying. Subsequent dating of the remaining pre- and post collapse flows should provide more detailed timing of the Mt Amarelo collapse.