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Relative sea level change during MIS 3: a black hole in the world. New observations from Calabria, central Mediterranean sea

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Estimates of global ice volume during MIS 3 (60-29 ka) can be constrained between -25 and -87 m (Shackleton, 2000; Waelbroeck et al., 2002; Clark et al., 2009; Hughes et al., 2013; Grant et al., 2014). As regards the maximum altitude reached during this period there are few observed data for a comparison between the global curves and the variations due to different rheostay of the mantle in coastal areas. Uncertainties on the rheostatic behaviour near- or far-fields from the ice bulk during cold period, make it very difficult to estimate the local sea level during MIS 3. Several factors make investigations of MIS 3 sea level difficult: i) the areas where suitable coastal sediments formed are currently submerged at depths of few tens of meters below present sea level; ii) the preservation of geomorphic features and sedimentary records is limited due to the erosion occurred during the Last Glacial Maximum (LGM) with sea level at depth of -130m, followed by marine transgression that determined the development of ravinement surfaces).

Few data were observed worldwide, especially when tectonics or GIA in the near field leads to uplifts. Our research aims to point out what has been published globally and in the Mediterranean, but, above all, to illustrate the sections of new outcrops in Cannitello (Calabria, Italy) where we have found and dated fossiliferous marine pocket beaches deposited on uplifted bed metamorphic rock. Radiocarbon ages of marine shells (about 43 kyrs cal BP) indicate that these outcrops (presently at 28 and 30 meters above sea level) belong to MIS 3.1. Based on some

considerations regarding the altitude of MIS 3.1 highstand, the correction for altitude with the local vertical tectonic movements and GIA of the Cannitello outcrops allows us to revise the eustatic altitude of this highstand. This is consistent with the recent findings (Gowan et al., 2020), which are based on a novel ice sheet modelling technique.

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