OMEONGA (WEMBO-NYAMA): iSALE HYDROCODE SIMULATIONS. E. Martellato[1], G. Cremonese[2], M. Massironi[1,3] and G. Monegato[3]. [1]CISAS, University of Padova, Via Venezia 15, 35131, Padova, Italy (e-mail: elena.martellato@oapd.inaf.it); [2]INAF-Osservatorio Astronomico di Padova, Vic. Osservatorio 5, 35122, Padova, Italy; [3]Geoscienze Department, University of Padova, Via Giotto 1, 35127, Padova, Italy.

Introduction: The study of Earth impact craters may be difficult because of modifications caused by the cumulative effects of erosion, transport, deposition and weathering caused by vegetation in warm climate.

Description of the structure: Omeonga (Wembo-Nyama) is located in Central Africa, and more precisely, in the Eastern Kasai province (R.D. Congo), centered at 3°37'50"S, 24°31'00" (Fig. 1). It is recognizable from satellite images for the perfect roundness of the ring underlined by the Unia River, a tributary river of the Lomani River. This structure was interpreted as an impact structure from geological observations [1].

Fig. 1: *GoogleEarth image of the Ring of Omeonga (Wembo-Nyama).*

Omeonga, with its diameter up to 36-km, pinpoints to a major event happened during Cretaceous-Cenozoic time span. Considering the minimum diameter of 36 km, the crater should be a real peak-ring basin and the relative diameter of the impactor should have been of about 2 km. According to Melosh (1989) [2], most of the ejecta should be limited to a deposit extending up to 5 crater-radius away from the basin. Hence, in our case, a blanket of 90 km from the rim is expected, even if a larger spread of ejecta may be possibly taken into account (e.g., ejecta blanket up to 250 km away from the 36 km-diameter Manson crater, Iowa [3]).

iSALE simulations: We are using the iSALE hydrocode to model the Omeonga crater formation and support the geological data in favour to an impact origin [4, 5]. In this work, we will present the preliminary results of these simulations, that are included into the scientific activity of support of the STC channel of the SIMBIO-SYS camera in the project of ESA BepiColombo mission.

We hypothesize a rock projectile, about 2 km in diameter, that strikes the target with the typical velocity on Earth's orbit (25 km/s for asteroids) and perpendicular with respect to the surface. Since almost every impact occurs obliquely, with 45° as the most probable impact angle [6], we take into account a lower impact velocity to simulate a more reliable initial condition. However, impact angle and direction may have a minor effect on crater morphology, while crater size and ejecta curtain are influenced by it. This impact event should have excavated material from the basement (Fig. 2), made up by a 800 m sandstone layer that overlies about 30 km granite upper crust.

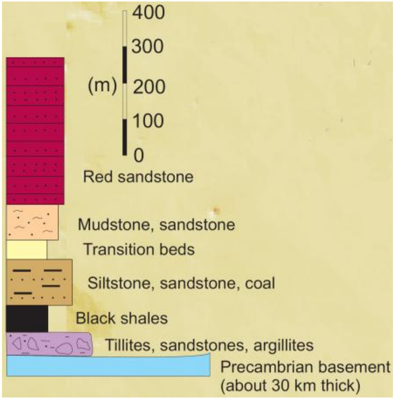

Fig. 2: *Stratigraphy of Permian-Jurassic succession of Karoo Basin in Congo (Lukuga), mod. after Catuneanu et al. 2005 [7].*

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