SCHRÖDINGER BASIN, MOON: ESTIMATION THE IMPACT CONDITIONS.

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Introduction: The Schrödinger Basin with a mean diameter of *315 km*, and location centered at *75°S, 132.5°E* [1], is the best-preserved impact basin of its size on the Moon [2]. In this work are estimated the possible impact conditions, that could have given origin to this basin. The models used here are based on: some equations postulated by *Holsapple* (crater depth) [4]; scaling; polynomial analysis; and an adaptation of quantum formalism for the mathematical representation of the energy pulse generated in the impact point, in where besides, is used one solution of the *Korteweg-De Vries's* equation [3].

Results obtained with the models: The development of this crater is realized in 4 stages [5], in which are specified the variables of impact more common [5], as follows: a). Contact/Compression Stage: In this stage the diameter of the impactor is estimated in *~ 36.55 km*, the velocity of impact is *~ 1.92 km/s*, the impact angle is *~ 54.98°*, the density of impactor is *~ 2.30 g/cm^3*, the crater depth is estimated in *~ 6.38 km* [4], the melt volume is *~ 14,470.2 km^3*, the total energy of impact is estimated in *~ 4.50×10^{30} Erg (~ 1.07×10^8 megatons)*, pressure to *1 km* of the impact point is *~ 2.24×10^4 Gpa*, and the seismic shock-wave magnitude is *>10.0* according the *Richter Scale*. b). Modification/Excavation Stage: In this stage the diameter of transient crater is *~ 205.88 km*, the number of ejected fragments is *~ 1.63×10^{11}*, the average size of the fragments is *~ 16.53 m*, the average density of fragments is *~ 2.52 g/cm^3*, the minimal distance of ejection of fragments is *~ 16.15 km*, the velocity of ejection is *~ 298.39 m/s*, the minimal angle of ejection is *~ 8.54°*, and the minimal height of ejection is *~ 606.30 m*. c). Colapse/Modification Stage: In this stage the pressure toward the final crater rim decrease to *~ 0.90 Gpa*. d). Final Crater Stage: The relation between the transient crater and the final crater is *~ 0.65* according to *French* [5], the time of creation for the final crater can be estimated in *~ 2.93 minutes* according to *Schmidt* and *Housen* [4], the hydrothermal zone could begin from *~ 102.94 km* from the nucleus of impact, the lifetimes estimated for this hydrothermal zone are of *~ 5.50 Ma* to *~ 8.58 Ma* with uncertainties of *~ (+/-) 1.06 %* to *~ (+/-) 2.89 %*, i.e., from *~ (+/-) 0.06 Ma* to *~ (+/-) 0.25 Ma*, hydrothermal temperatures from *0.25 years* to *1,400 years*, after of the impact, are estimated in *~ 92.47 °C* to *~ 37.25 °C*, the final temperature to the *8.58 Ma* after of the impact, is estimated in *~ 2.76 °C* + environment temperature. In this stage is also possible, to estimate (hipothetically) the minimal diameter of one dust cloud of *~ 130.92 km*.

References: [1] Kramer G. Y. et al. 2013. *Icarus* 223:131-148. [2] Wilhelms D. 1987. The Geologic History of the Moon. *Geological Survey*, Washington D.C. Professional Paper 1348. U.S. [3] Echaurren J. C. and Ocampo A. C. 2003. *Geophysical Research Abstracts*, Vol. 5, 04450, EGS-AGU-EUG Joint Assembly. [4] Holsapple K. A. Theory and Equations for "Craters from Impacts and Explosions". [5] French B. M. 1998. Traces of Catastrophe: A Handbook of Shock-Metamorphic Effects in Terrestrial Meteorite Impact Structures. LPI Contribution No. 954, Lunar and Planetary Institute, Houston. 120 pp.