The meteoroid fluence at Mars due to comet Siding Spring

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ABSTRACT

Long-period comet C/2013 A1 (Siding Spring) is headed for a close encounter with Mars on 2014 Oct 19. A collision between the comet and the planet has been ruled out, but the comets coma may envelop Mars and its man-made satellites. We present an analytic model of the dust component of cometary comae that describes the spatial distribution of cometary dust and meteoroids and their size distribution. If the coma reaches Mars, we estimate a total incident particle fluence on the planet and its satellites of 0.01 particles per square meter. We compare our model with numerical simulations, data from past comet missions, and recent Siding Spring observations.