Micrometeorite ablation in Martian Atmosphere

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As the comet approaches the Sun, it releases a large amount of dust grains which are known as meteoroids. According to the International Astronomical Union, a meteoroid is an interplanetary body, deriving from asteroids or comets, with a mass range from one thousand millionth of kg and ten millionth of a kg. The speed of meteoroid is significantly less than the orbital velocity of the comet. However the speed of meteoroid are in the range of few km/s to few km/s. As a meteoroid enters the Earth's atmosphere, it collides with air molecules. The meteoroids ablaze and produce ionization peak at lower altitude in the Martian ionosphere, where the density of atmosphere is enough to provide necessary drag. E and F peaks have been measured in the daytime ionosphere at altitude 110km and 135km.

The collisions between free atoms and air molecules produce heat, light and ionization i.e. a meteor. The equation of motion, ablation, and energy were solved for meteoroid impact ionization. We solved the equation of motion, ablation and energy by Runge Kutta fourth order methods and 3rd order Adams Bash forth in MATLAB. The velocity, temperature and mass variation of a micrometeorite in its journey through a planetary atmosphere is highly inter-linked. Velocity of micrometeorite is constant up to 160 km and further decreasing with altitude due to atmospheric drag. Mass of micrometeorite is also constant upto 140 km and then mass decreasing. In the case of temperature of micrometeorite is independent from velocity, at 200 km is increasing and at 120 km the temperature is decreasing due to frictional heating.

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