

0.1 Interaction of sungrazing comets with the solar atmosphere

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The passage of nuclei of sungrazing comets through the solar atmosphere is considered theoretically. It is found that within the solar chromosphere aerodynamic fragmentation of cometary nuclei takes place. Transversally expansion of the fragmented cometary nucleus matter under the action of ram aerodynamic pressure within the solar chromosphere and photosphere leads to the transformation of the spherical nucleus to a flattened/plane structure. Fully aerodynamic deceleration of the high-velocity disk-like fragmented matter occurs within a relatively very thin subphotosphere layer and has essentially explosive character. The energetics of the high-temperature impulsive process considered corresponds to that of solar flares. Photometric and spectrophotometric monitoring of sun-approaching small-perihelion comets in a wide spectral range using space observatories like SOHO is highly desirable to study high-temperature phenomena near the solar surface connected with cometary nuclei explosions.