

## The capture of solar wind alpha particles on Mars and Venus

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### Abstract

Helium is detected in the atmospheres of both Mars and Venus. It is believed that radioactive decay of uranium and thorium in the interior of the planets' is not sufficient to account for the abundance of helium observed. Alpha particles in the solar wind are suggested to be an additional source of helium, especially at Mars. Recent hybrid simulations show that as much as 30% of the alpha particles can be lost from the solar wind due to charge-exchange processes associated with the Mars/solar wind interaction. We use ion data from the ASPERA-3 and ASPERA-4 instruments on Mars and Venus Express to estimate how efficient solar wind alpha particles are captured in the atmospheres of the two planets.