SOLAR PRO.

SolarInnovate Energy Solutions

Pressure-type solar system

Overview

Why is pressure so high in the Solar System?

Out at the boundary of our solar system, pressure runs high. This pressure, the force plasma, magnetic fields and particles like ions, cosmic rays and electrons exert on one another when they flow and collide, was recently measured by scientists in totality for the first time — and it was found to be greater than expected.

Did our Solar System form from a ring of planetesimals?

These features are associated with pressure bumps trapping dust particles at specific locations, which simulations show are ideal sites for planetesimal formation. Here we show that our Solar System may have formed from rings of planetesimals—created by pressure bumps—rather than a continuous disk.

How is air pressure created on Earth?

On Earth we have air pressure, created by air molecules drawn down by gravity. In space there’s also a pressure created by particles like ions and electrons. These particles, heated and accelerated by the Sun create a giant balloon known as the heliosphere extending millions of miles out past Pluto.

How generically applicable is our model to other planetary systems?

It is legitimate to wonder how generically applicable our model is to the formation of other planetary systems. Observations and statistical analysis suggest that planets with sizes between those of Earth and Neptune (1 and 4 R⊕) are common around other stars 58. These planets are typically referred to as super-Earths.

What is the scale height of a Solar System planet?

For solar system planets the scale heights are given in Table 4.3. H was calculated with the indicated Te↵ and mean particle mass µ/µH. The scale heights are in a narrow range of 5 – 40 km.

What is the vertical structure of planetary atmospheres?

The vertical structure of planetary atmospheres can be characterized by their thermal structure which depends on the heating processes and energy transport mechanisms. For our discussion of these processes we take the Earth atmosphere as a guideline. The atmo-spheric temperature profile is used as basis to distinguish di↵erent atmospheric layers.

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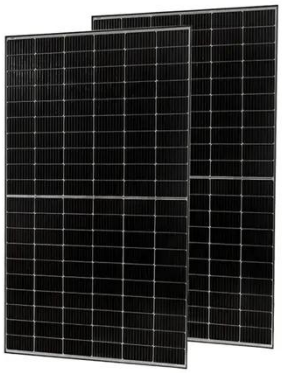

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