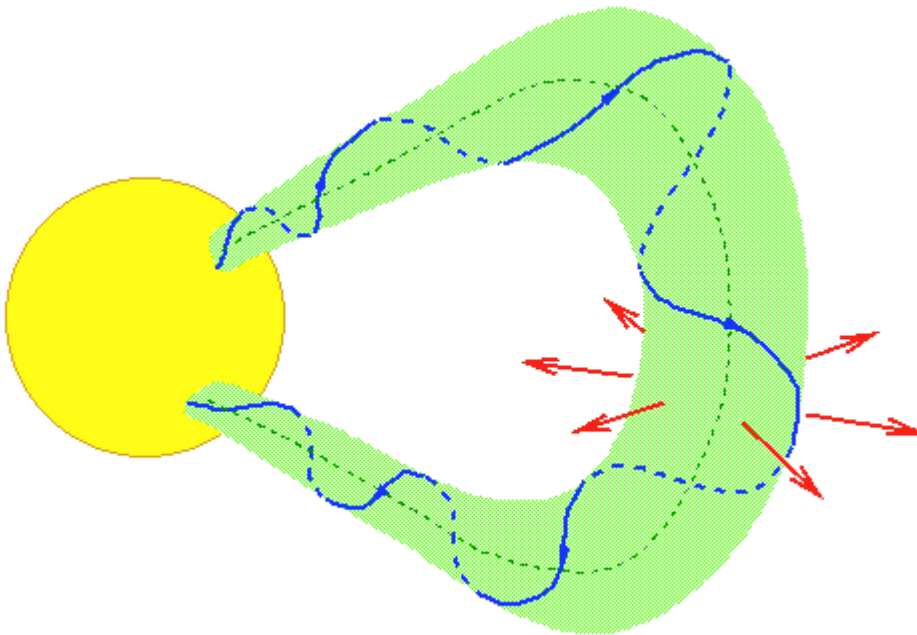


Coronal mass ejections and magnetized clouds

By J. De Keyser

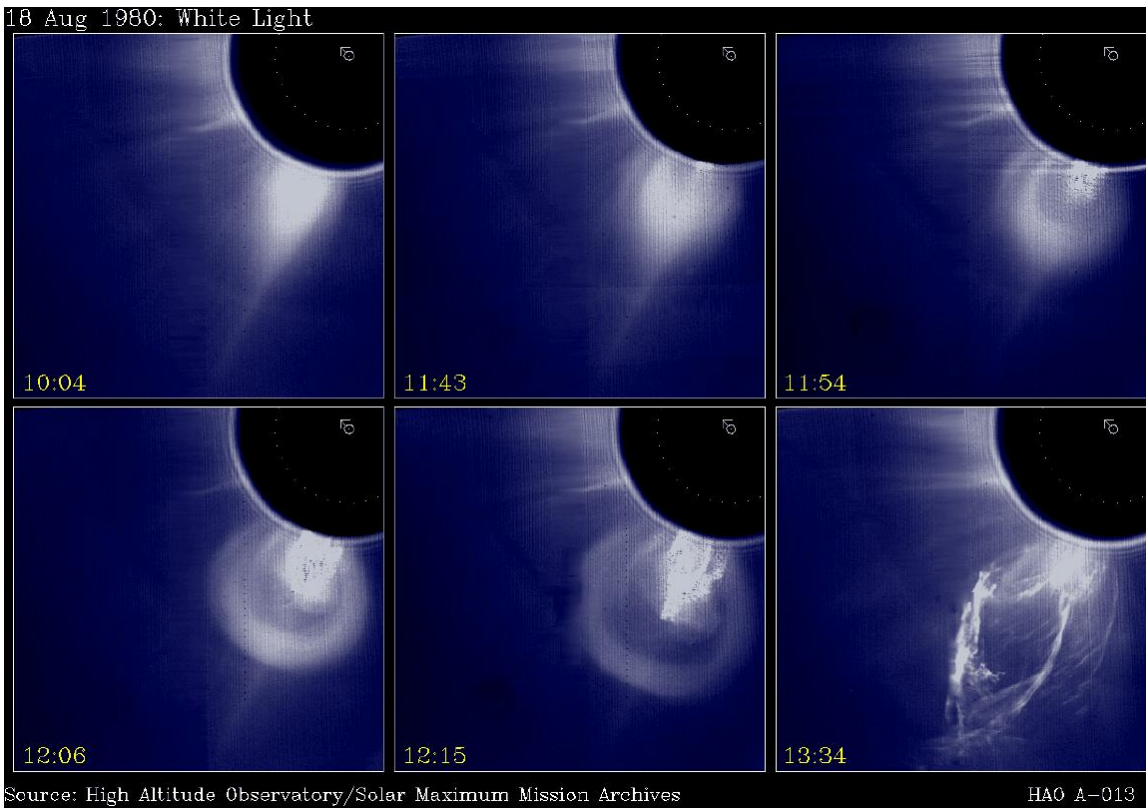
It is known that large structures can exist within the corona, that may catapult plasma into space with a speed of 1000 km/s. Such an event is called a coronal mass ejection. Obviously such events leave their traces in the solar wind: They produce large expanding plasma clouds that push the normal solar wind aside. Not only does such a cloud reach further and further away from the Sun, but at the same time it expands because the pressure inside is larger than in the surrounding solar wind.



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This causes the formation of collision areas around the cloud. The term "magnetized cloud" is used for plasma in which one clearly recognizes the structure of a "magnetic flux-rope": such structures have the form of a long pipe in which the magnetic field is wound up like a helix (see sketch). That is the structure that one can also recognize in large prominences in the solar corona itself.





As shown in the series of pictures alongside, these clouds can take immense proportions: In a couple of hours a structure as large as the Sun itself comes into being. The material that is flung away moves through the solar wind - and can for example hit the Earth. On such an occasion, a magnetic storm can be triggered in the magnetosphere of the Earth.

Maybe you are wondering whether or not the Sun will eventually lose all its matter, because it continuously blows away the solar wind and frequently experiences an explosive loss of material during coronal mass ejections. Well, you do not have to worry: The solar wind and the matter released during a coronal mass ejection are very rarefied - the Sun can easily continue for a long period!

