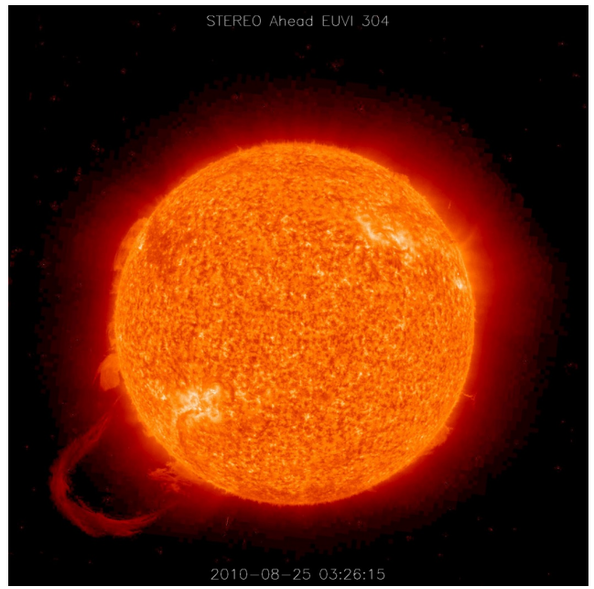
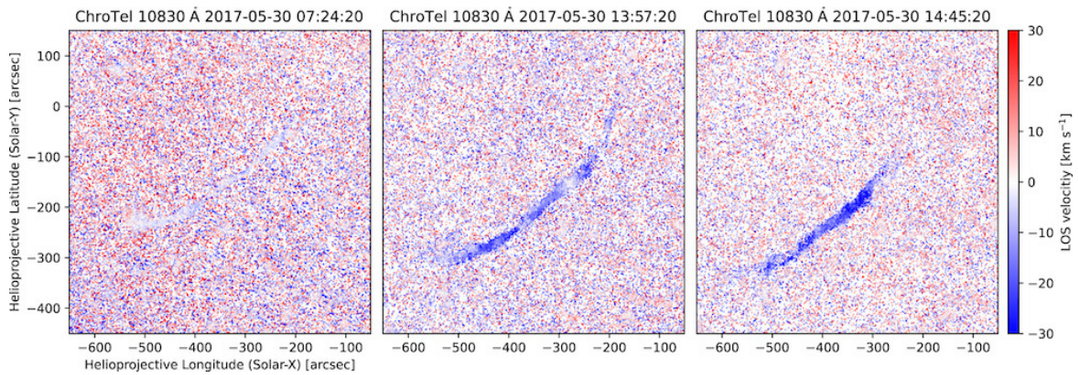
Why do solar filaments erupt?

- Solar material suspended by magnetic fields observed on the solar disk are called **filaments**. The same structures observed against the darkness of space are called **prominences**.
- Filaments can erupt hours after they form or remain stable for days to months.
- When they do erupt, they can cause a coronal mass ejection that can create huge magnetic disturbances at objects they pass such as planets or spacecraft.
- But what causes filaments to become unstable and erupt? Can we predict their eruption?
- In this work, the evolution of a filament's velocity is tracked. The velocity and acceleration of the filament provide clues to the physical mechanism that causes them to become unstable and erupt.
- This view is providing new understanding and may one day lead to the prediction of these filament eruptions and space weather.



A solar prominence extends from the Sun's surface in the lower left quadrant of this image. If this prominence were viewed against the Sun's disk, the relatively cool plasma would appear dark against the solar surface. [NASA/STEREO]



Evolution of the filament's line-of-sight velocity over time. Several hours before the eruption (left panel), the filament's velocity was close to zero. As the eruption progressed (center and right panels), the filament's outward velocity increased. Blue means moving away from the Sun.

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