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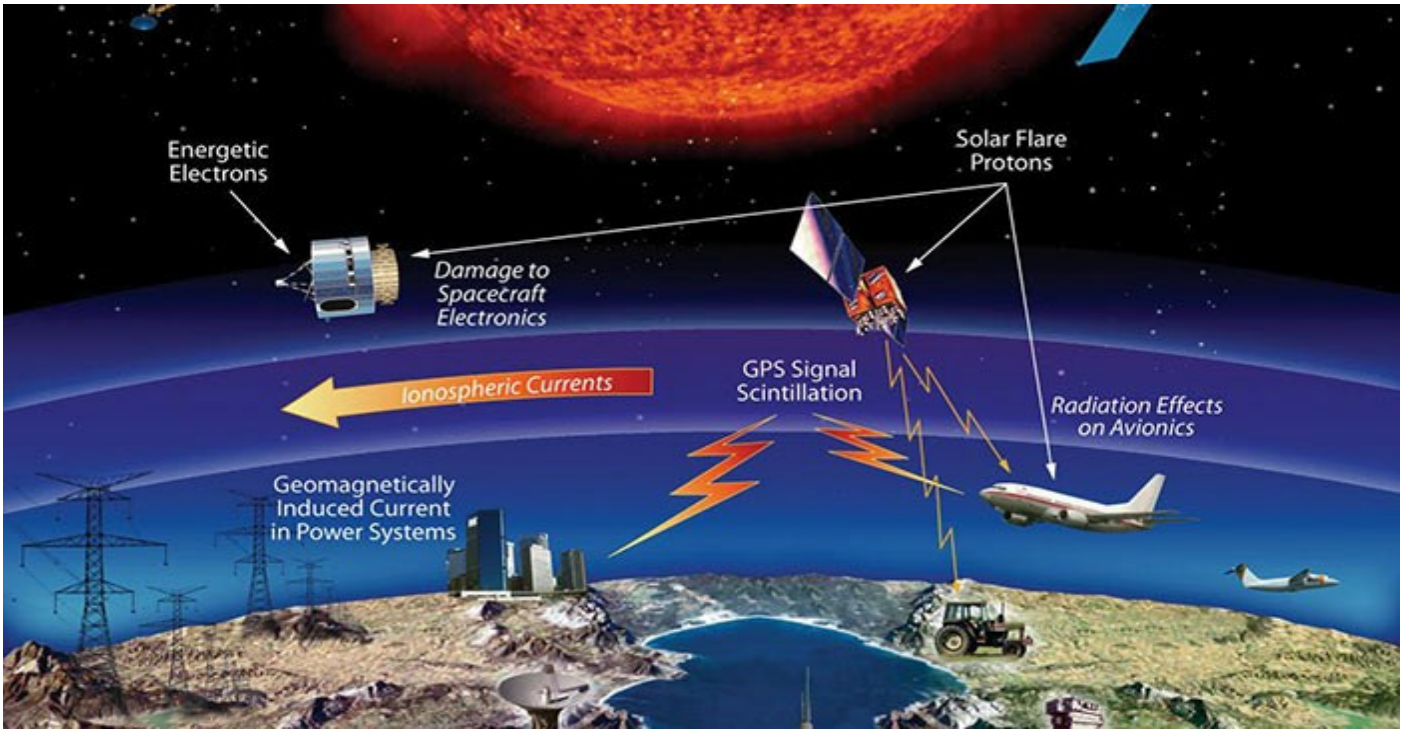
Solar Flares and the Effect on PV Installations

All solar flares produce high energy particles and radiation that are fundamentally dangerous to living organisms. However, and the main thing to be aware of is that at the surface of the Earth we are protected from solar flares by the Earth's magnetic field and atmosphere. The most dangerous flare emissions are high-energy protons and electromagnetic radiation, mostly x-rays.

X-rays from flares don't penetrate low into our atmosphere; they only really disturb the Earth's ionosphere which can affect some radio communications.



Occasionally we experience geomagnetic storms which is what everyone gets worried about. Major geomagnetic storms are themselves induced by coronal mass ejections (CMEs). Coronal mass ejections are often associated with flares, but not always, it's easy to understand how people get the two mixed up. CME's are frequent during the active phase of the Sun's 'Solar Maximum' cycle which is 9 to 14 years. There was a solar maximum in 2000. In 2006 NASA predicted a solar maximum in 2010 or 2011, and thought that it could be the strongest since 1958. However, the solar maximum was not declared to have occurred until 2014, and it was ranked among the weakest on record, so not something that people should get all that worried about.!

The issue with geomagnetic storms is really temporary loss of electrical power but over a large region. The best known case of this occurred in 1989 in Quebec. High currents in the magnetosphere induce high currents in power lines, blowing out electric transformers and power stations. This is most likely to happen at high latitudes, where the induced currents are greatest, and in regions having long power lines and where the ground is poorly conducting.

So for Australia the likelihood of affect from a geomagnetic storm is very low, if we did experience another high intensity solar maximum then it would be the grid, or large long power lines are large heavy duty transformers that feel the effects, nothing on a domestic level is really susceptible to the currents being inducted and most defiantly not solar panels as the actual conductive path is really very small indeed.