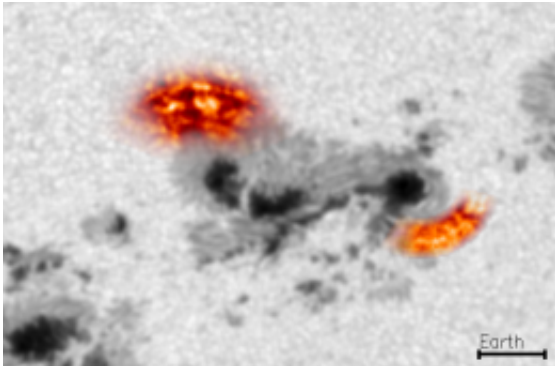


# Solar eruptions cause sunquakes

April 2 2012

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(PhysOrg.com) -- A study led by UCL's Mullard Space Science Laboratory has shown for the first time that sunquakes can be produced during eruptions of magnetic field and charged particles, as the immense magnetic structure blasts off into the Solar System. The results were presented by Dr. Sergei Zharkov at the National Astronomy Meeting 2012 in Manchester on Friday 30th March 2012.

The first observation of a sunquake was reported by Kosovichev & Zharkova in the late 1990s. During the last decade it has become well established that explosions in the Sun's atmosphere, known as solar

flares, can create sunquakes through the impact of powerful beams of [particles](#) which travel into the [Sun](#). This new study shows that eruptions of material known as coronal mass ejections are also able to produce sunquakes.

The authors studied an eruption that took place on 15 February 2011 and found that sunquakes 1000 times more powerful than the Great East Japan Earthquake, March 2011, were triggered at the two ends of the erupting rope of magnetic field. This indicates that the sudden expansion of the [magnetic field](#) that takes place as the eruption occurs is likely to play an important role in generating the quakes. The eruption raced through the [Solar System](#) with an average speed of 600 km/s and was Earth directed, driving a geomagnetic storm and a beautiful display of the aurora when it reached us.

"Sunquakes were first predicted in 1972 by Wolff and are seen at the Sun's surface as circular ripples emanating outward, looking much like those produced as a stone is dropped into to a pond. However, they are actually caused by sudden a release of energy below the solar surface that produces sound waves which bend and travel up to the surface of the Sun, lifting it and producing the ripples," said Zharkov.

These spectacular events are helping scientists understand how energy and momentum are transported from the Sun's atmosphere down to the surface and into the interior. With solar activity currently increasing, and due to peak in 2013, more sunquakes will be observed helping unravel the mechanisms that cause them.

Provided by Royal Astronomical Society

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