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The active Sun and its implication for the heliosphere  
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### **Estimating the magnetic energy and helicity in solar active regions**

Thalmann, J. K.<sup>1</sup>, Inhester, B.<sup>1</sup> and Wiegmann, T.<sup>1</sup>

<sup>1</sup>Max-Planck-Institut für Sonnensystemforschung, Max-Planck-Str. 2, 37171  
Katlenburg-Lindau, Germany

During solar eruptions the reconfiguration of the magnetic field causes part of the previously stored magnetic energy to be transformed into kinetic and thermal energy. These topological changes are due to magnetic reconnection, which not only requires free magnetic energy but is also constraint by the magnetic helicity. To define the magnetic helicity as a well-defined quantity, the relative helicity is usually evaluated. Extrapolation of the coronal magnetic field based on photospheric magnetic field measurements is well established and a newly developed method to calculate the relative magnetic helicity allows us to monitor the coronal energy and relative helicity content during solar eruptions.