Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02120, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02120
EGU General Assembly 2008

Evolution of the coronal magnetic field of NOAA active region 10540

J. K. Thalmann and T. Wiegelmann

Max-Planck Institute for Solar System Research, Katlenburg-Lindau, Germany
(thalmann@mps.mpg.de)

We investigate the 3D coronal magnetic field structure of NOAA AR 10540 in the period of January 18 - 21, 2004 associated with two M-class flares (a M1.0 flare on January 19 at 12:40 UT and a M6.1 flare on January 20 at 07:43 UT). The coronal magnetic field dominates the structure of the solar corona and consequently plays a key role for the understanding of the initiation of flares. The most accurate presently available method to derive the coronal magnetic field is the nonlinear force-free field extrapolation from measurements of the photospheric magnetic field vector. We use vector magnetograph data obtained with the Solar Flare Telescope (Tokyo) as boundary condition for extrapolating the magnetic field into the corona with the nonlinear force-free optimization code of Wiegelmann (2004). We analyze the corresponding time series of coronal equilibria regarding the temporal evolution of the magnetic energy content related to the flaring activity. Furthermore, we investigate the variation of the energy density, i.e. the amount of energy stored in the coronal field above the flaring region during these consecutive days.