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Variations of Geomagnetic Dst-index and Seismicity at Northern Tien-Shan

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On the Northern Tien-Shan in the recent past there have been several catastrophic earthquakes: Verny (June 8, 1887, 23:35 UT, 43.1N, 76.8E, M = 7.3); Chilic (July 11, 1889, 22:14 UT, 43.2N, 78.7E, M = 8.3); Kemin (January 3, 1911, 23:25 UT, M = 8.2). Because of such strong events are possible here in the future, the search for earthquake precursors for this area is relevant. Some years ago, Sobolev and Zakrzhevskaya [2003] http://adsabs.harvard.edu/abs/2003EAEJA.....135S have revealed an influence of geomagnetic storms on seismicity. They showed, in particular, that in Northern Tien-Shan the number of earthquakes increases within a few days after the sudden onset of geomagnetic storm (SSC). In our work, we attempted to identify the image-signal of seismic precursor in variations of geomagnetic Dst-index, which describes geomagnetic storm. Data on earthquakes with K=>11.0 occurred in area 42.8-43.5N, 76-78E in 1970-2010 (23 events) have been analyzed. Time of earthquake occurrence was taken as a "key event". Using the superposed epoch method, the averaged distribution of hourly Dst values was obtained for 480 hours before and 480 hours after a key event. It is found that a precursor image-signal has a pattern of geomagnetic storm with clear evident both the sudden onset, main and recovery phases as well. Earthquakes with K=>11.0 tend to occur at recovery phase about of 12 days after the sudden onset. The results confirmed earlier findings by Sobolev and Zakrzhevskaya [2003] and can be used for prediction of strong earthquakes in Northern Tien-Shan.