Possible space weather influence on the Earth wheat prices

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We present development of our study of possible influence of space weather, modulated by cycle of solar activity, on the price bursts in the Earth markets. In our previous works [1,2] we showed that correspondent response may have place in the specific locations, characterized by: a) high sensitivity of the weather (cloudiness, in particular) to cosmic ray variation; b) "risk zone" agriculture; c) isolated wheat market with limited external supply of agriculture production. We showed that in this situation we may wait specific "price burst" reaction on unfavorable phase of solar activity and space weather, what lead to corresponding abnormalities in the local weather and next crop failure. We showed that main types of manifestation of this connection are: a) Distribution of intervals between price bursts must be like to the distribution of intervals between correspondent extremes of solar activity (minimums or maximums); b) price asymmetry between opposite states of solar activity (price in the one type of activity state is systematically higher then in the opposite one).

We showed in our previous publications that this influence in interval distribution is detected with high reliability in Mediaeval England (1250-1700) both for wheat prices and price of consumables basket. We showed that for period of Maunder Minimum price asymmetry of wheat prices observed (all prices in minimum state of solar activity was higher the prices in the next maximum state). We showed later that this price asymmetry had place in 20-th century in USA durum prices, too.

In this work we attempt to answer on the question: why in the selected regions and countries evident manifestations of this effect are high and reliable, but in the same time in another regions and countries it is much weaker or absent in general. We compiled data base of European wheat prices from about 100 wheat markets during interval 1300-1900 years for 13 countries in different climate, geographical and wheat market conditions. We analyze sensitivity of the price behavior in this sample and their sensitivity to space weather as function of localization and compactness of crop area. We discuss our results in context of possible application to the agriculture production in different regions in present time.

[1] L.Pustil'nik, G. Yom Din, Influence of solar activity on the state of the wheat market in medieval England, *Solar Physic,s* **223**, 335–356, 2004.

[2] L.Pustil'nik, G. Yom Din, Space climate manifestation in Earth prices – from Me-

dieval England up to modern U.S.A., Solar Physics, **224**, 473–481, 2004.