



## **Interpretation of short and long-term oscillations of solar activity by alpha-omega dynamo model with two macro-cells of meridional fluxes**

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Solar magnetic activity is related with generation strong magnetic fields in the depths of the Sun and manifested in sunspot occurrence on the solar surface. The amplitude and the spatial configuration of the magnetic field of our star are changing over the years. The most widely known variations of solar magnetic field are 11-years cycles and grand minima. The generation and evolution of the solar magnetic field and other stars is usually related to the dynamo mechanism. This mechanism is based on the consideration of the joint influence of the alpha-effect and differential rotation. Dynamo sources can be located at different depths (active layers) of the convection zone and can have different intensities. Based on such a system, the dynamical system with meridional fluxes in the case of the stellar dynamo with independent active layers has been constructed. We obtained quasi-biennial magnetic field oscillations for middle layer of the convective zone which can account for short term (2.5 years) oscillations often reported for 11 year solar cycles. Magnetic field waves from top and bottom layers of the convective zone are found generated with close frequencies whose interaction leads to beating effects responsible for the grand cycles (350–400 years) superimposed on a standard 22 year cycle. Using our model we made prediction of poloidal and toroidal fields on short (until 2040 year) and long-term timescale (until 3200 year) (V. V. Zharkova, S. J. Shepherd, E. Popova & S. I. Zharkov, Nature SR, 2015).