

Solar periodicity of 154 days

The 154 day periodicity in the Sun was first reported on gamma-ray flares (Rieger et al., 1984). Later the same periodicity has been found in many other parameters related to Sun and solar wind/IMF, although it does not seem to be a persistent periodicity, and the exact period varies between 140 and 170 days. For example, Cane et al. (1998) found a 153 day periodicity in IMF strength for solar maximum years 1978-1982, but not for the preceding or subsequent solar cycles. Variables showing ~154 day periodicity:

Variable	Reference
Flare related	Rieger et al., 1984; Bai and Cliver, 1990; Bai and Sturrock, 1993
Active region parameters (sunspots areas etc.)	Lean and Brueckner, 1989; Lean, 1990
Solar F10.7 flux	Lean and Brueckner, 1989
IMF strength and solar wind velocity	Cane et al., 1998

References

- Bai, T., and E. W. Cliver, A 154 day periodicity in the occurrence rate of proton flares, *Astrophys. J.*, 363, 299, 1990.
- Bai, T., and P. A. Sturrock, Evidence for a fundamental period of the Sun and its relation to the 154 day complex of periodicities, *Astrophys. J.*, 409, 476, 1993.
- Cane, H. V., I. G. Robinson, and T. T. von Rosenvinge, Interplanetary magnetic field periodicity of ~ 153 days, *Geophys. Res. Lett.*, 25, 4437-4440, 1998.
- Lean, J. L., Evolution of the 155 day periodicity in the sunspot areas during solar cycles 12 to 22, *Astrophys. J.*, 363, 718, 1990.
- Lean, J. L., and G. E. Brueckner, Intermediate-term solar periodicities: 100-500 days, *Astrophys. J.*, 337, 568, 1989.
- Rieger, E., G. H. Share, D. J. Forrest, G. Kanbach, C. Reppin, and E. L. Chupp, A 154-day periodicity in the occurrence of hard solar flares, *Nature*, 312, 623, 1984.