# $^{44}$Ti in meteorites and Galactic Cosmic Ray flux over the past 235 years.

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The solar magnetic field modulates the galactic cosmic ray (GCR) flux in the heliosphere and hence one approach to determine solar activity variations in the past is to study the isotopes produced in the matter exposed to GCR flux. Isotopic concentration of radionuclides like $^{10}$Be and $^{14}$C, produced in the atmosphere and deposited in sediments or ice cores or incorporated in other terrestrial reservoirs like trees, are also effected by terrestrial phenomena such as geomagnetic field, climatic changes, deposition rate variations and exchange within the various terrestrial reservoirs, which tend to mask the solar signal. In contrast, cosmogenic isotopes in meteorites, which are produced when the rocks are exposed to cosmic rays in the interplanetary space, offer a unique tool for decoupling the terrestrial causes from the solar activity variations. In particular, we have identified $^{44}$Ti (half-life 59.2 y) as an ideal index in meteorites, useful for studying GCR variations on centennial scale. We have measured $^{44}$Ti activity in 19 stone meteorites that fell during the period 1766 to 2001. The gamma-activity measurements of cosmogenic isotopes were performed using a highly specific and selective large volume Ge-NaI (Tl) spectrometer, which we have set- up in the underground Research Station of Monte dei Cappuccini in Torino (Italy). The $^{44}$Ti activity, corrected for the target element abundances and shielding effects, shows a decreasing trend over the past 235 years. Superimposed on this declining trend, the $^{44}$Ti activity shows a centennial oscillation in phase with Gleissberg solar cycle. Our results are consistent in phase and magnitude with doubling of the solar open magnetic field intensity over the past century.