

## **Anomalous shift of Curie temperature in iron-nickel Invar alloys by high-energy heavy ion irradiation**

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$\text{Fe}_{0.68}\text{Ni}_{0.32}$  Invar alloys are irradiated with 3.54 GeV Xe ions, and with 2.71 GeV U ions at room temperature. Measurements of the magnetic moment of specimens under AC magnetic field before and after irradiation show that the Curie temperature,  $T_c$ , for the irradiated region increases with increasing the ion fluence. This phenomenon appears even at low ion fluence, implying that it is attributed to ion-induced high-density electronic excitation. It is well known that  $T_c$  of such Fe–Ni Invar alloys strongly depends on the Ni concentration and the external pressure. With increasing the Ni concentration from ~30%,  $T_c$  increases, and with decreasing the lattice parameter by the external pressure,  $T_c$  decreases. Therefore, the increase in  $T_c$  by high-energy ion irradiation can be explained as originating from the lattice expansion and/or the composition change, which are induced by the high-density electronic excitation.