

## A Training Mechanism in Superconducting Accelerator Magnets

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### **Abstract**

We describe and discuss a training mechanism that has thus far received little attention. We believe that standard construction procedures for cabled NbTi superconducting accelerator magnets cause portions of the cable to be in axial compression. Axial compression of strand cable increases the axial compliance of the cable. Subsequent collaring and assembly procedures maintain high compliance conditions, until Lorentz axial loading and azimuthal unloading allow axial stick-slip conductor movements toward progressively stiffer cable conditions. A simple model predicts that the postulated stress/strain conditions exist near the ends of recent Fermi LHC IR quadrupole magnets. We suggest several ways to reduce magnet training based on this mechanism.