

Magnetic properties of synthetic taenite at high pressure

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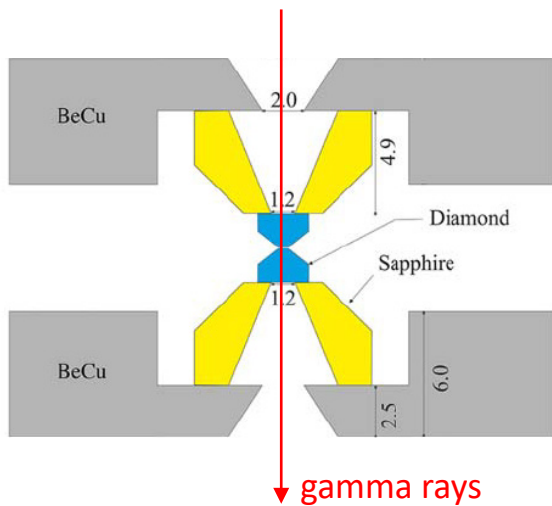


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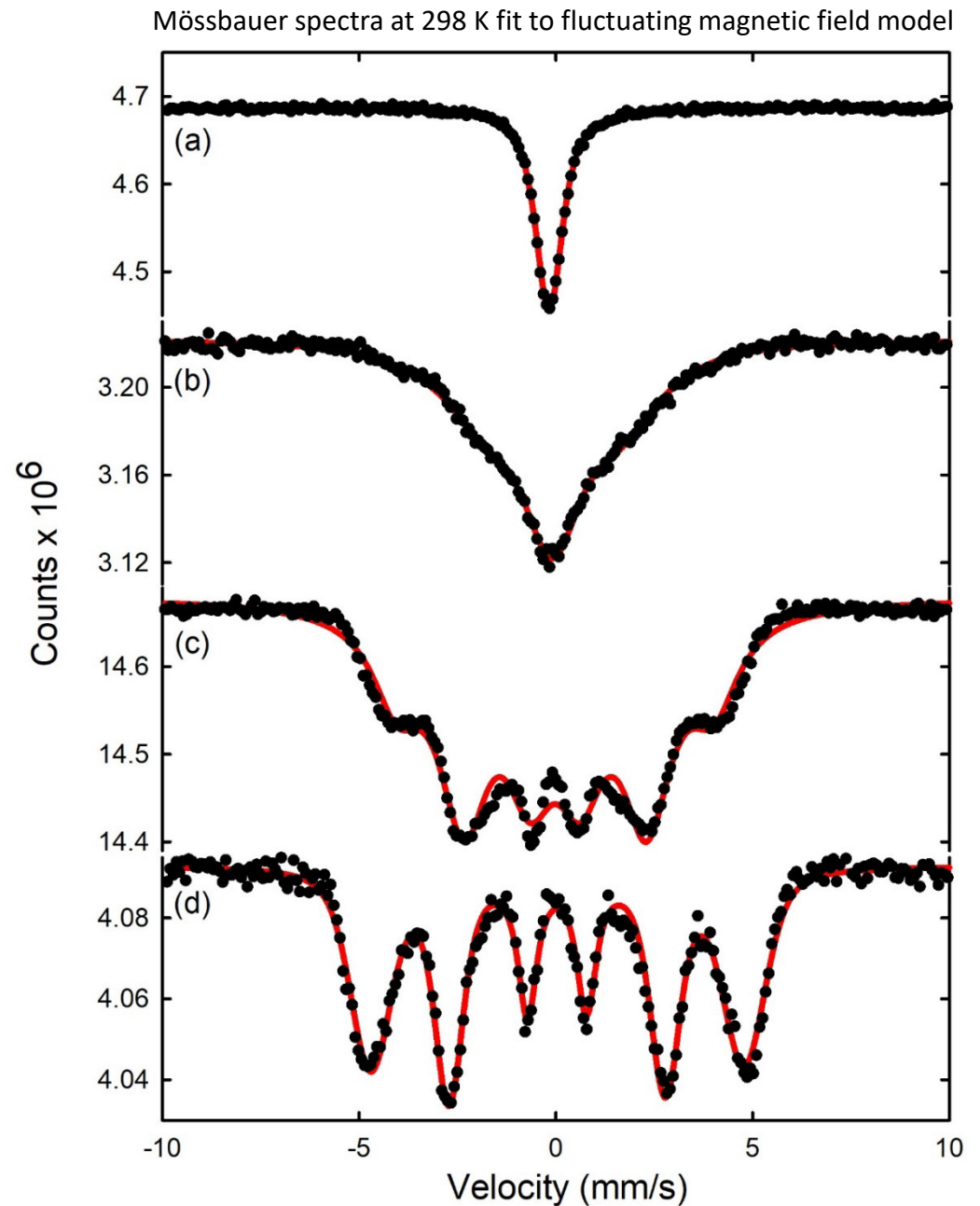
- Taenite, an iron-nickel alloy with 20-40 at% nickel, is a major constituent of iron meteorites that have been used to infer planetary core compositions
- Many aspects of its magnetic properties are controversial, particularly near the Invar (“invariable”) composition around 36 at% nickel
- Open questions include the pressure at which magnetism is lost

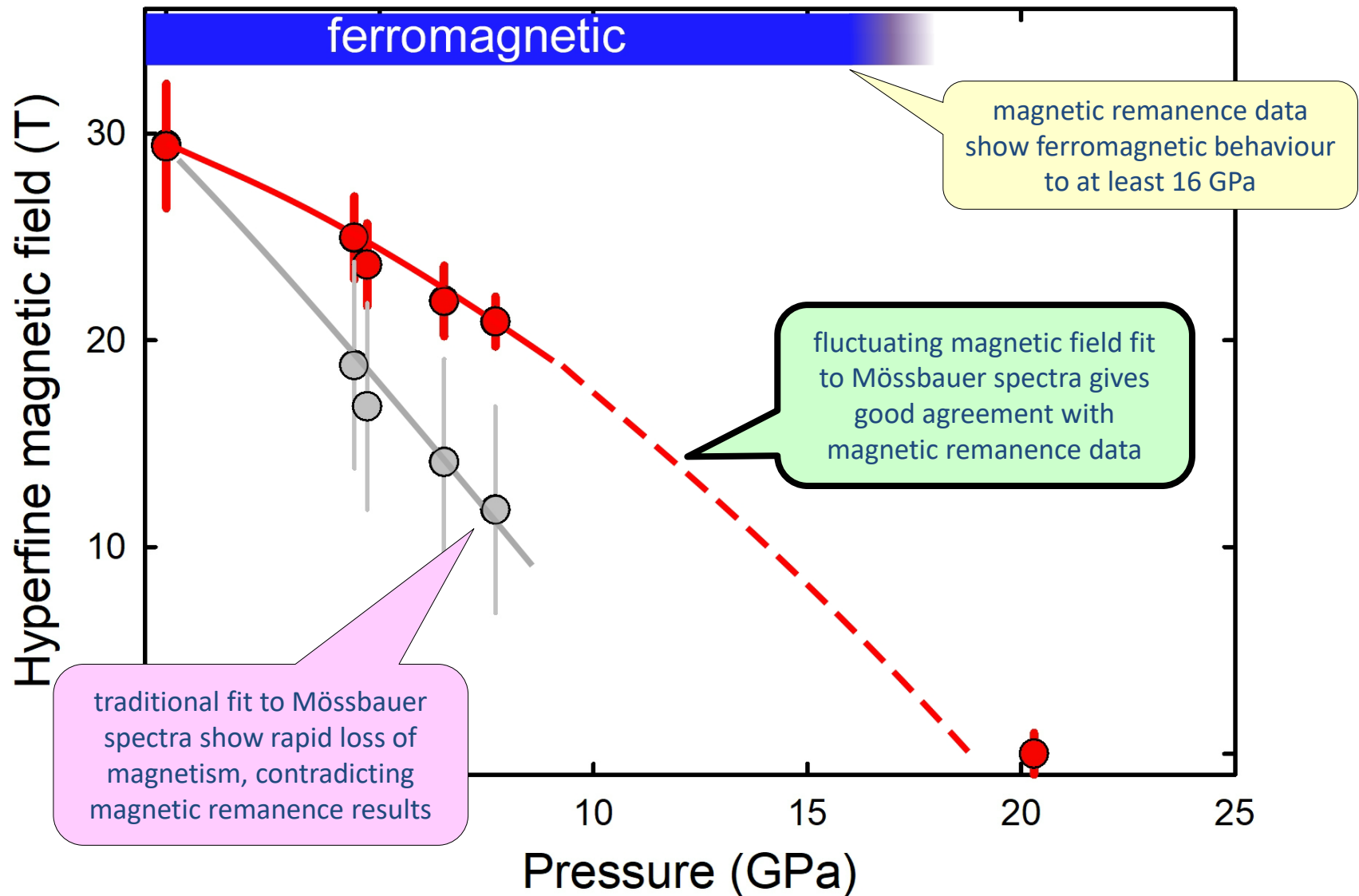
We therefore undertook a combined magnetic remanence and Mössbauer study of synthetic taenite at high pressure

- we synthesised $\text{Fe}_{0.62}\text{Ni}_{0.38}$ alloy powder
- we loaded sample into non-magnetic diamond anvil cell
- we measured Mössbauer spectra during decompression



- we measured isothermal remanent magnetization of same sample





We infer that dynamic spin fluctuations occur in magnetic $\text{Fe}_{0.62}\text{Ni}_{0.38}$; these can influence the magnetic behaviour of iron-nickel alloy-containing meteorites