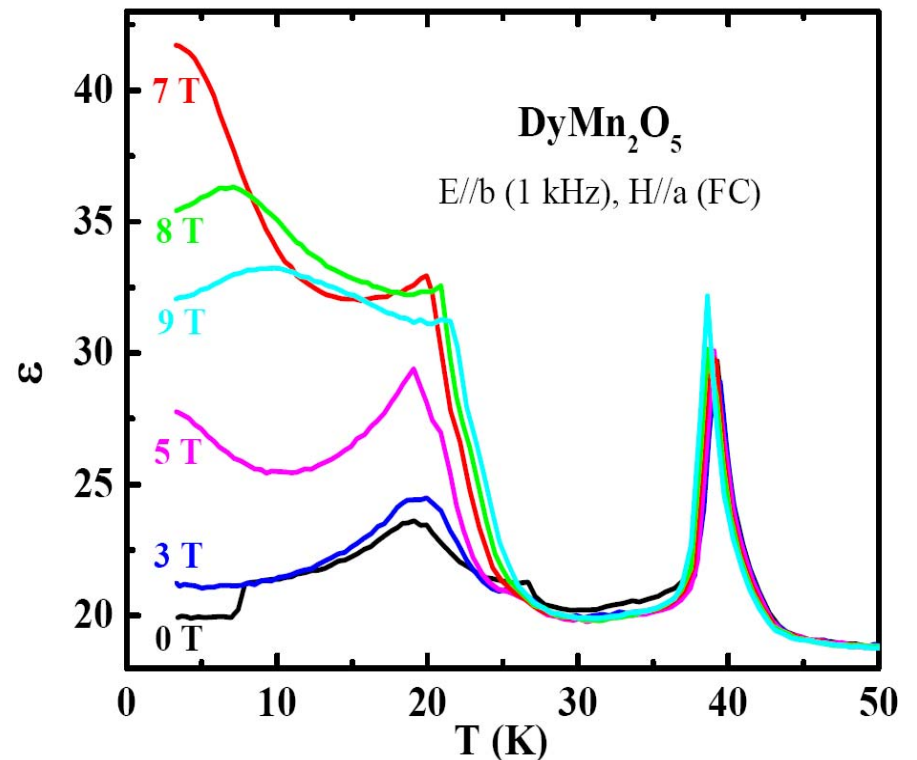


The Magneto-Capacitance Effect and Electro-Magnons in Multiferroics

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Multiferroic compounds exhibit dielectric anomalies at the magnetic phase boundaries and in some cases a strong magneto-capacitance effect. This is an example of the cross interaction between magnetic and electric effects that makes these materials interesting for new functionalities. We have observed that this effect in the $RE\text{Mn}_2\text{O}_5$ materials (RE=rare earth) is associated with a magnon excitation shifting to low frequencies and acquiring an IR dipole moment. This novel effect, due to the strong coupling between the magnon and phonon excitations, provides an important mechanism for magneto-capacitance in multiferroics.



Anomalies in the static dielectric constant in DyMn_2O_5 at magnetic phase boundaries. Similar features are observed in many $RE\text{Mn}_2\text{O}_5$ and $RE\text{MnO}_3$ compounds.