

## Low energy excitations in vector spin glasses

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The low temperature physics of glassy systems has not been yet completely understood. Glasses possess an excess of low energy excitations when compared to crystals: at low frequency, the VDoS of many glassy systems seems to follow a quartic law, understood in terms of phenomenological theories such as soft potential models. These soft excitations are found to be quasi-localised in microscopic spatial regions of the samples: they are related to soft spots of the system, showing anomalously high responses to external mechanical perturbations.

A first-principle theoretical framework where such glassy excitations emerge naturally is provided by spin glass systems. In this talk we will analyse two mean field vector spin glass models, the first with all-to-all interactions and the second with sparse interactions. We will present our analytical and numerical results at zero temperature about the spectral properties of these systems, focusing mostly on the Heisenberg model (spin with three components). We will show that these models feature quasi-localised soft excitations, which will be connected to the spin glass transition.

