## How the geometry of the dispersion law influences the appearance of bound states

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We show, for the example of the Heisenberg ferromagnet, how catastrophe theory can be applied to the problem of two quasi-particles interaction. It is known that the classical case of nearest neighbors interaction does not completely clarify the common picture of the spectrum of two quasi-particles interaction, since an arbitrarily small perturbation of potential at the second step implies the appearance of other bound states. The stability of the number of bound states under potential perturbation turns out to be completely determined by the geometrical properties of the family of two quasiparticles energy functions parametrized by their full quasimomentum. If the spin has a large value then the spectrum of the two particles bound states can be completely described for models with generic potentials.