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The incommensurate-commensurate phase transition of anisotropic XXZ model on the triangular lattice XUEFENG ZHANG, SHI-JIE HU, AXEL PELSTER, SEBASTIAN EGGERT, Univ Kaiserslautern — We investigate the XXZ model on the triangular lattice with anisotropic ferromagnetic xy coupling and antiferromagnetic z coupling. In previous studies, an incommensurate supersolid phase was found when introducing anisotropy of interactions in different directions. However, the mechanism of the incommensurate phase is still unknown. In the strong coupling region where interactions in the z direction are larger than in the xy plane, we found that quantum fluctuation of domain wall excitations can reduce the energy and cause the incommensurate order. By using quantum Monte Carlo simulations, we confirmed our theoretical analysis and found that the number of domain walls and the incommensurate k-vector monotonically increase with the anisotropy. The physics is dimensionally reduced to 1d.

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