

Multiple- Q order of the frustrated Heisenberg model on the honeycomb lattice under magnetic fields

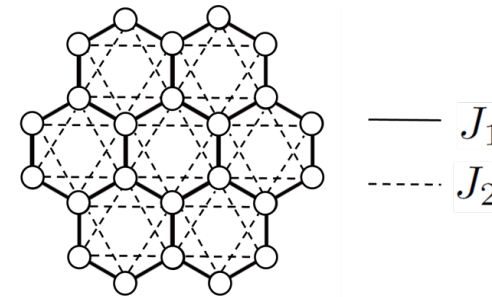
Tokuro Shimokawa and Hikaru Kawamura, Osaka University, Japan

The multiple- q states and Skyrmion lattice state could be realized in other lattices with a trigonal symmetry?

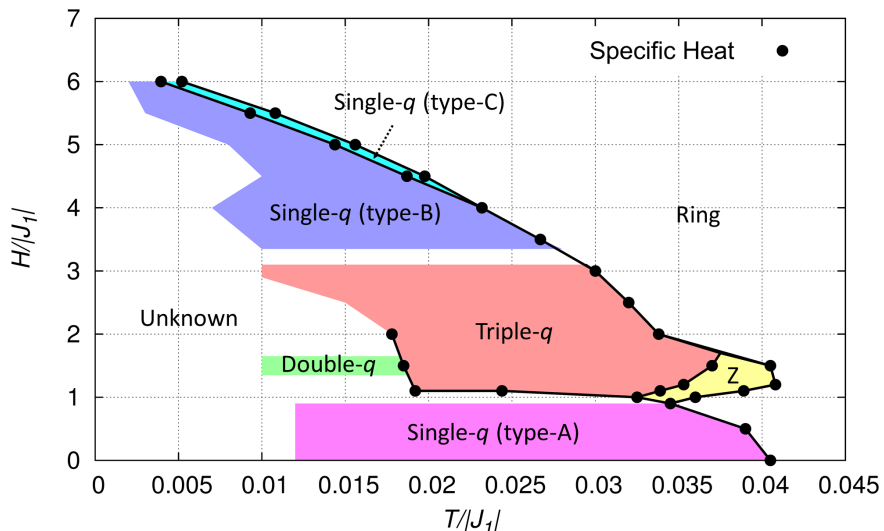
J_1 - J_2 classical Heisenberg model on the honeycomb lattice

$$\mathcal{H} = J_1 \sum_{\langle i,j \rangle} \mathbf{S}_i \cdot \mathbf{S}_j + J_2 \sum_{\langle\langle i,j \rangle\rangle} \mathbf{S}_i \cdot \mathbf{S}_j - H \sum_i S_i^z$$

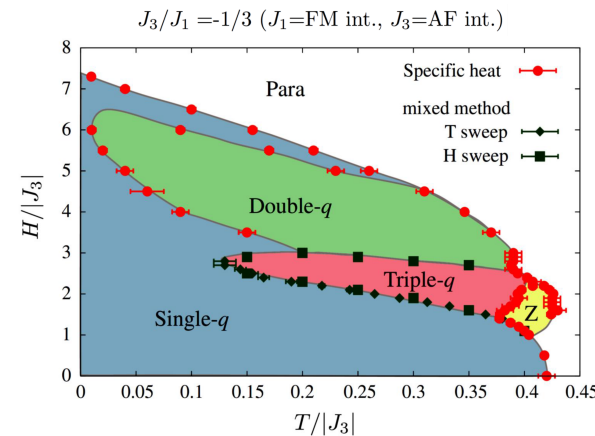
$$J_1 = 1, J_2 > 0$$



Phase Diagram under magnetic fields ($J_2/J_1=0.3$)



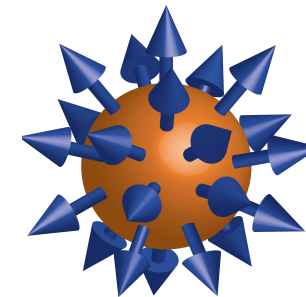
Triangular case



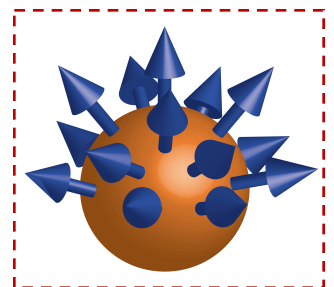
T. Okubo *et al*, Phys. Rev. Lett. **108**, 017206 (2012).

Triple- q state \neq Skyrmion lattice

Triple- q state = Meron-like lattice



“Skyrmion”



“Meron-like”