

PS07

Vortex Berry phase theory of antiferromagnets in a magnetic field

Akihiro Tanaka (National Institute for Materials Science)

We show that the low energy physics of antiferromagnets in a magnetic field in any spatial dimension can be understood in terms of Berry phase effects, associated with space-time vortex objects of the Neel vector in the plane perpendicular to the field. At particular values of the magnetization, a Z_2 gauge symmetry emerges, which allows for occurrence of a fractionalized phase. This work was performed in collaboration with K. Totsuka.