Magnon

It is a quasiparticle , a collective excitation of the electrons spin structure in a crystal lattice .

Excitations propagate through the system of spin in a wave like form are called spin wave or

when they are quantized called Magnons .

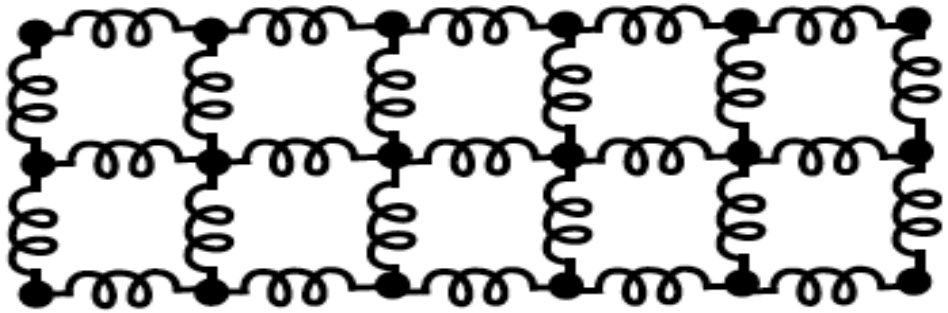
Phonons and magnons are quasi-particle associated to the lattice and spin excitations .

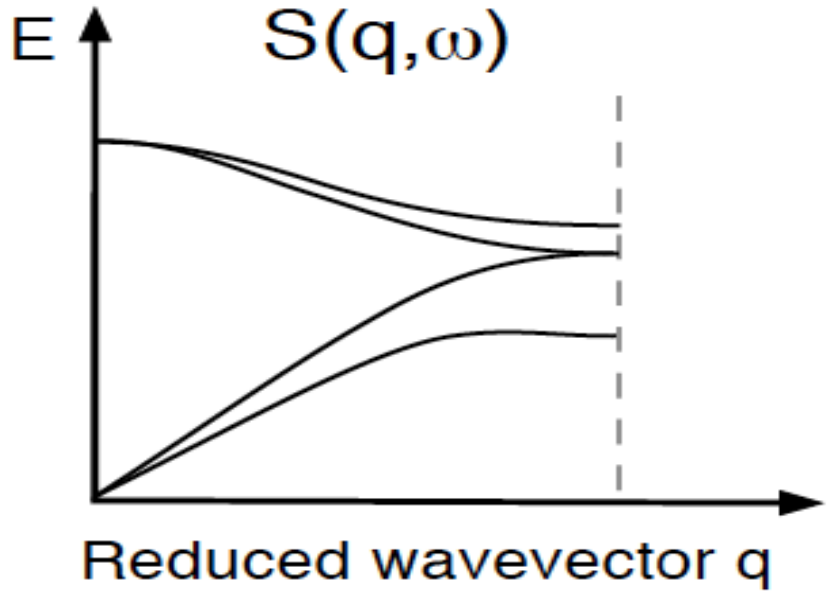
They are characterized by a frequency and a wave vector q .

Dispersion relationship between energy !ù and momentum !q .

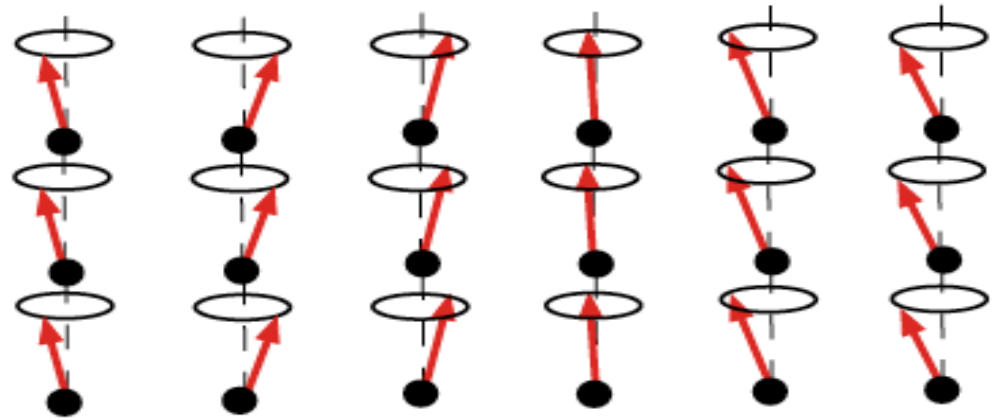
Magnons and phonons are **BOSONS**, and they are described by *symmetric wavefunction with respect to the exchange of particle positions .*

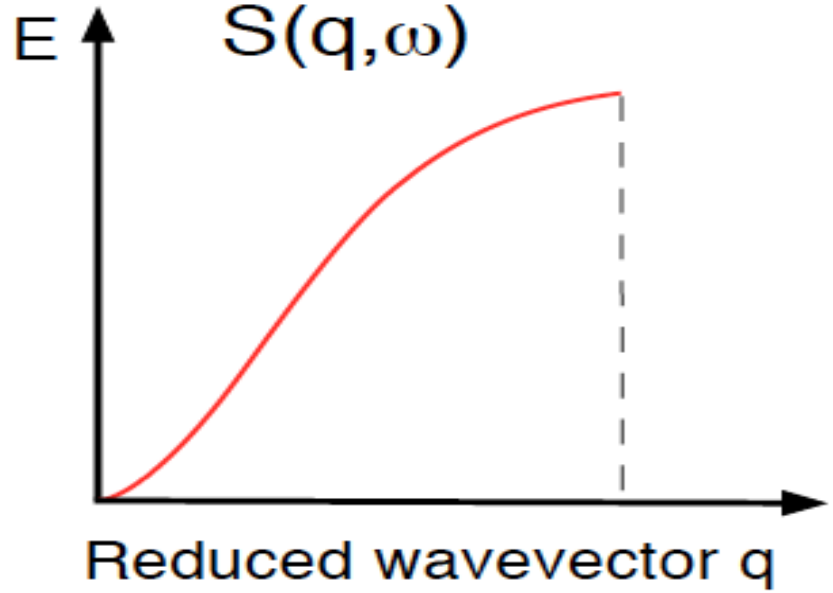
Phonons





Magnons



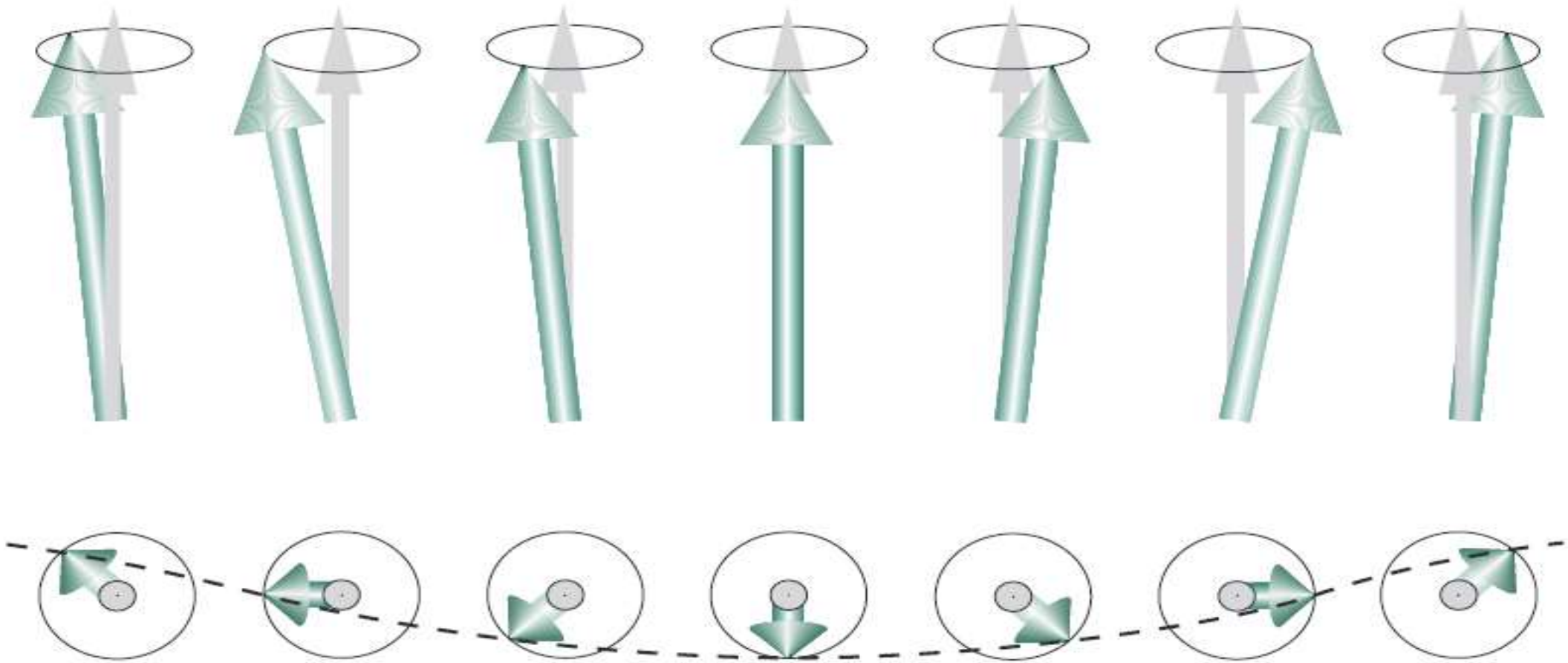


Lattice waves => Phonons

Collective acoustic and optic lattice vibrations .

Spin-waves => Magnons

Collective magnetic excitations associated to the in-phase precession of the spin moments .



Magnons are bosonic modes of spin lattice that corresponds roughly to the phonon excitations of the nuclear lattice .

As temperature is increased ,

the thermal excitation of spin waves reduces a frromagnet’s spontaneous magnetisation .