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Theory of thermal expansion of localized paramagnons

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We have investigated the thermal expansion of localized paramagnets, with almost negligible wave-vector dependence of their dumping constant of spin fluctuations. By assuming the Lorentzian form of the dynamical susceptibility, we have found that the thermal expansion coefficient has the T-linear dependence at low temperatures. The volume dependence of the spectral width of spin fluctuations is included accoding to the theory of magneto-volume effects by Takahashi. This dependence is equivalent to that of the specific heat, and both of their T-linear coefficients are related with the magnetic Gruneisen parameters. Our localized paramagnon model will be well applicable to almost localized 5f electron system, UPt_3.

Biography

Rikio Konno has completed his PhD at the age of 28 years from University of Tokyo and postdoctoral studies from Tsukuba University. He is the Science Section Head of Kindai University Technical College, a famous college based on Kindai University in Japan. He has published more than 25 papers in reputed journals. He won the International Plato Award for the Educational Achievement, the Order of International Fellowship Golden Peace Prize, and Ultimate Achiever Award for Science-Certificate in 2009. He is a member of Physical Society Japan, a Life member of American Physical Society, and a member of Institute of Physics, U.K.

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