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10:15	Cobalt nanoparticles: Self-organisation stability under extreme conditions	**S.5.8**	☆

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Resume : Magnetic metallic nanoparticles (NPs) are self-assembled, under specific conditions, in organized structures, called supracrystals [1]. Such self-organization process requires a small particle size dispersion as well as the use of an adapted coating agent preventing coalescence and oxidation. Supracrystals potential covers various fields, including electronics, charge transport and information storage. However, their thermodynamic properties have been little examined, particularly under high pressure conditions. The current work aims at establishing the temperature-pressure phase diagram of Cobalt-based supracrystals hold together via lauric acid chains. To this end, two experimental techniques were employed in combination with a resistive heated membrane diamond anvil cell (mDAC) for the generation of high pressures (0-20 GPa) and moderate temperatures (0-200 °C) conditions. First, low wavenumber Raman scattering was used to determine both spherical and quadrupole vibrational modes of individual Co NPs [2]. In addition, the collective vibrations of the supracrystal, and their dependence on temperature/pressure conditions, were detected with a pump-probe picosecond acoustics setup [3]. Lauric acid was studied separately in order to identify its contribution to the physical properties of the supracrystals. [1] I. Lisiecki et al., Adv. Mater. 15, 712 (2003). [2] G. Simon et al., J. Raman Spectrosc, 47, 248 (2015). [3]F. Decremps et al., Ultrasonics, 56, 129 (2015).