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**Novel phase transitions in coupled dipolar chains.**[1] PAULA MELLADO, Adolfo Ibanez University — We study the properties of a classical magnetic system realized by two chains of U(1) rotors coupled via Coulomb interactions in the dumbbell approach. Magnets in chain I and chain II rotate in the x-z and y-z planes respectively. Ground state correlations and the system wave excitation spectrum are found using spin wave theory. The displacement "d" of chain II from chain I induces dynamics in the system and yields two first order magnetic phase transitions. The transitions happen at critical displacements, which notably, are independent of the magnetic charge at the tips of the magnets, suggesting a geometrical origin.

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paula mellado
Adolfo Ibanez University

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