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Common signatures of Coulomb fragmentation of excited realistic nuclei and phase transitions in hypothetical confined matter[1] JAN TÕKE, UDO SCHRÖDER, University of Rochester — The phenomenon of binary and multiple Coulomb fragmentation of realistic nuclei is compared to the time-asymptotic fragmentation of nuclear matter confined in a hypothetical freezeout volume. It is shown within the framework of schematic microcanonical nuclear thermodynamics that both types of processes may be described by similar mathematical equations and both may exhibit signatures of second-order phase transitions at onsets of different fragmentation channels. In the present context, phase transitions are identified as changes in the most likely fragmentation channel/state as the excitation energy of the system increases. They occur as the conditional entropy functions corresponding to different fragmentation channels/states cross at characteristic excitation energies. The critical role of the diffuse surface domain of finite nuclei is discussed, along with the importance of a proper approximation of the microcanonical ensemble involved.

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Jan Tõke
University of Rochester

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