Extreme Fe-Ni isotopic fractionation in iron meteorite misfits Hopp, T.[1]*, Dauphas, N.[2], Spitzer, F., Burkhardt, C. [1], Kleine, T. [1]. [1]Max-Planck-Institut für Sonnensystemforschung, Göttingen; [2]Department of Earth and Planetary Sciences, The University of Hong Kong, Hong Kong. *hopp@mps.mpg.de

Ungrouped iron meteorites are an understudied population of differentiated planetesimals. In order to better constrain the physico-chemical evolution of these bodies, we here report mass-dependent Fe and Ni isotopic composition data of 26 ungrouped iron meteorites. The Fe and Ni isotopic compositions of ungrouped irons cover a similar range to grouped irons and an on average heavier Fe isotopic composition in the irons compared to chondrites. The heavier Fe isotopic composition of ungrouped irons is dominated by five samples displaying large isotopic fractionation, which can be explained by secondary processes like impact reheating or hit-and-run collisons in the early solar system. The ungrouped iron meteorite Nedagolla is the most volatile depleted meteorite and has one of the most fractionated Fe and Ni isotopic compositions ever observed in planetary materials. Nedagolla's extreme isotopic composition can be explained by evaporative loss of 14% Fe and 7% Ni, respectively. Such a significant evaporative loss of main component elements requires high temperatures, and provides additional evidence for Nedagolla's formation during a highly energetic event.