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**Collisional cooling of ultra-cold atom ensembles using Feshbach resonances** LUDWIG MATHEY, EITE TIESINGA, PAUL JULIENNE, CHARLES CLARK, NIST and JQI — We propose a new type of cooling mechanism for ultra-cold fermionic atom ensembles, which capitalizes on the energy dependence of inelastic collisions in the presence of a Feshbach resonance. We first discuss the case of a single magnetic resonance, and find that the final temperature and the cooling rate is limited by the width of the resonance. A concrete example, based on a  $p$ -wave resonance of  $^{40}\text{K}$ , is given. We then improve upon this setup by using both a very sharp optical resonance and a very broad magnetic resonance and show that one can reach temperatures competitive to those created by current technologies.

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