Universal analytic inelastic rate constants for three particles in a harmonic trap[1] EDMUND MEYER, BRETT ESRY, Dept. of Physics, Kansas State — We present a study of three particles colliding in an isotropic harmonic trap in two regimes: when the oscillator length is much greater than and much less than the two-body s-wave scattering length. Transcendental equations that determine the energy of the interacting particles in the trap are derived for both bosonic and fermionic systems. We parametrize the recombination and relaxation using a complex short-range three-body phase. Explicit analytical expressions are obtained for the behavior of the lifetime for the case where the oscillator length is the largest length scale in the system. We find that, for negative scattering lengths whose magnitude is small in comparison to the oscillator length, that the lifetime scales as $|a|^4$, in agreement with previous studies on threshold behavior [1].

[1] J. P. D'Incao and B. D. Esry, Phys. Rev. Lett. 94, 213201 (2005)

Edmund Meyer
Dept. of Physics, Kansas State

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