

Abstract Submitted  
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**Spin correlations between individual colliding atomic pair** EYAL SCHWARTZ, Univ of Otago — We experimentally study spin-2 dynamics between two colliding individual  $85\text{Rb}$  atoms, trapped in tight optical tweezers. The two colliding  $85\text{Rb}$  atoms have effective attractive interactions that are not favorable for collision experiments using ultra-cold gases. Observing the individual pairs also allow for direct investigation of correlation between the magnetic sub-states of the two atoms, who keeps perfect correlation throughout our second long experiment times. Contrary to both finite temperature many-body experiments and zero-temperature two-body experiments, our finite temperature two-body experiments show relaxation dynamics rather than coherent spin-waves. Our experiments indicate that spin-exchange collisions may also provide a useful entanglement mechanism at finite temperatures, which will be less prone to heating during an experiment.

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