

Abstract Submitted
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Total control over ultracold interactions via electric and magnetic fields SERVAAS KOKKELMANS, BOUT MARCELIS, BOUDEWIJN VERHAAR, Eindhoven University of Technology — The scattering length is commonly used to characterize the strength of ultracold atomic interactions, since it is the leading parameter in the low-energy expansion of the scattering phase shift. Its value can be modified via a magnetic field, by using a Feshbach resonance. However, the effective range term, which is the second parameter in the phase shift expansion, determines the width of the resonance and gives rise to important properties of ultracold gases. Independent control over this parameter is not possible by using a magnetic field only. We demonstrate that a combination of magnetic and electric fields can be used to get independent control over both parameters, which leads to full control over elastic ultracold interactions¹.

¹B. Marcelis, B. Verhaar, and S. Kokkelmans, arXiv:0710.0733

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