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**Compensation sequences for improved ion addressing in Paul traps** TRUE MERRILL, KENNETH BROWN, Georgia Institute of Technology — The use of linear ion chains as quantum registers requires precision control in the intensity, duration, and spatial alignment of laser pulses. Employing compensation pulse sequences can relax these precision requirements by producing accurate gates in the presence of unknown systematic errors. We show that systematic addressing errors caused by beam misalignment and the finite bleed-through coupling of neighboring ions can be corrected to arbitrary accuracy using a family of narrow-band sequences. Furthermore a second class of pass-band sequences can compensate simultaneous systematic errors in addressing and pulse area, however at reduced efficacy. An experiment designed to test these findings is discussed.

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