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Hamiltonian engineering in strongly interacting Rydberg systems NITHIWADEE THAICHAROEN, Chiang Mai University, SEBASTIAN GEIER, TITUS FRANZ, ANDRE SALZINGER, ANNIKA TEBBEN, CLEMENT HAINAUT, GERHARD ZUERN, MATTHIAS WEIDEMUELLER, Heidelberg University — We demonstrate an ability to engineer Hamiltonian of many-body Rydberg spin systems using microwave pulse sequences. This allows us to obtain an arbitrary XYZ Heisenberg Hamiltonian out of an original XX Heisenberg Hamiltonian. To quantify this new Hamiltonian, we perform time evolution of our spin system under selected choices of initial state and interaction strength. The results are then compared with numerical simulations to extract the efficiency of the pulse sequences and additional effects.

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