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Studies of high-n, n^1G_4 and n^1H_5 strontium Rydberg states using microwave-optical multiphoton excitation[1] R. BRIENZA, G. FIELDS, F.B. DUNNING, Rice University, S. YOSHIDA, J. BURGDRFER, Institute for Theoretical Physics, Vienna University of Technology — We demonstrate that combined microwave/optical four- and five-photon excitation can be used to generate sizable numbers of high-n, $120 \leq n \leq 160$, strontium n^1G_4 and n^1H_5 Rydberg states, respectively, for use in studies of novel ultralong-range Rydberg molecules, of autoionization, and of planetary atoms. The quantum defects for both these states (and the n^1I_6) were measured using microwave spectroscopy and are in good agreement with theoretical predictions based on a two-active-electron model.

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