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Optical clockwork for a precision measurement in hydrogen¹ KENDRA VANT, LIA MATOS, CORT JOHNSON, Physics Department, MIT, FRANZ KAERTNER, EECS Department, MIT, LORENZ WILLMANN, Kernfysisch Versneller Instituut, THOMAS GREYTAK, DANIEL KLEPPNER, Physics Department, MIT — Ultracold trapped hydrogen (<100 micro kelvin) provides an excellent environment for spectroscopy and an opportunity to extend the experimental precision of the Lamb shift and the Rydberg constant. We will describe a newly constructed array of stable laser systems (ring dye laser, prismless Ti:saph femtosecond comb, synchronized diode lasers) designed to measure the ratio of the frequency of the 2S-8S transition to the frequency of the 1S-2S transition in hydrogen.

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