**E3 clock transition at 467 nm**
- natural linewidth: nano-Hertz range!
- excitation accompanied by large light shift due to coupling to other levels
- transition frequency has been measured with uncertainty 2·10⁻¹²
  
  [K. Hosaka et al., PRA 79, 033403 (2009)]

**Recent results:**
- implementation of a new efficient repumping scheme from the ¹F,₂ state
- excitation of E3 transition using a diode laser system with high frequency and power stability [1]
- high-resolution spectroscopy with 7 Hz FWHM

**467 nm E3 transition**

**Spectroscopy of octupole transition**
- 30 ms pulse excitation, 20 cycles/step, fit parameter: center frequency

**Extrapolation to zero light shift**

**436 nm E2 transition & long-time storage**

**E2 clock transition at 436 nm**
- natural linewidth 3.1 Hz
- secondary representation of the SI second

**Recent results:**
- investigation of magnitude and long-term variation of the stray-field induced quadrupole shift [2]
- systematic frequency uncertainty: 5·10⁻¹²
- 90 h continuous frequency measurement vs. CSF1 $\Rightarrow$ 5·10⁻¹² statistical uncertainty
