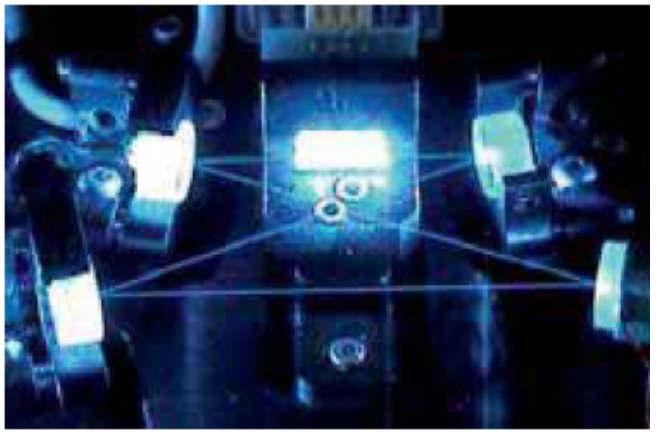
Laser source for spectroscopy of $^{209}Bi^{82+}$ at 243.9 nm

- frequency quadrupled MOPA at 976 nm;
- transfer cavity;
- frequency diagnostics.

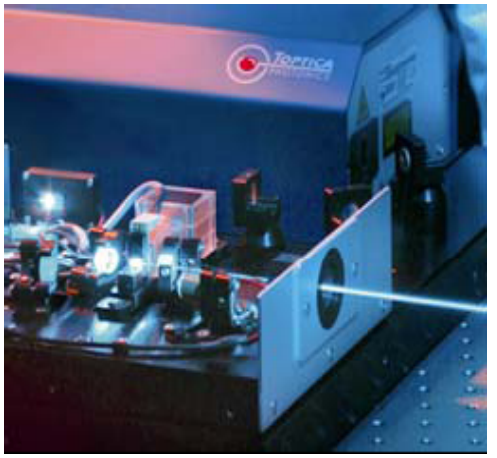
Norbert Herschbach, Claudia Siegel, and Gerhard Birkl
- TU Darmstadt -

SPECTRAP meeting 23rd of November 2007

Toptica TA-FHG-110



Toptica TA-FHG-110

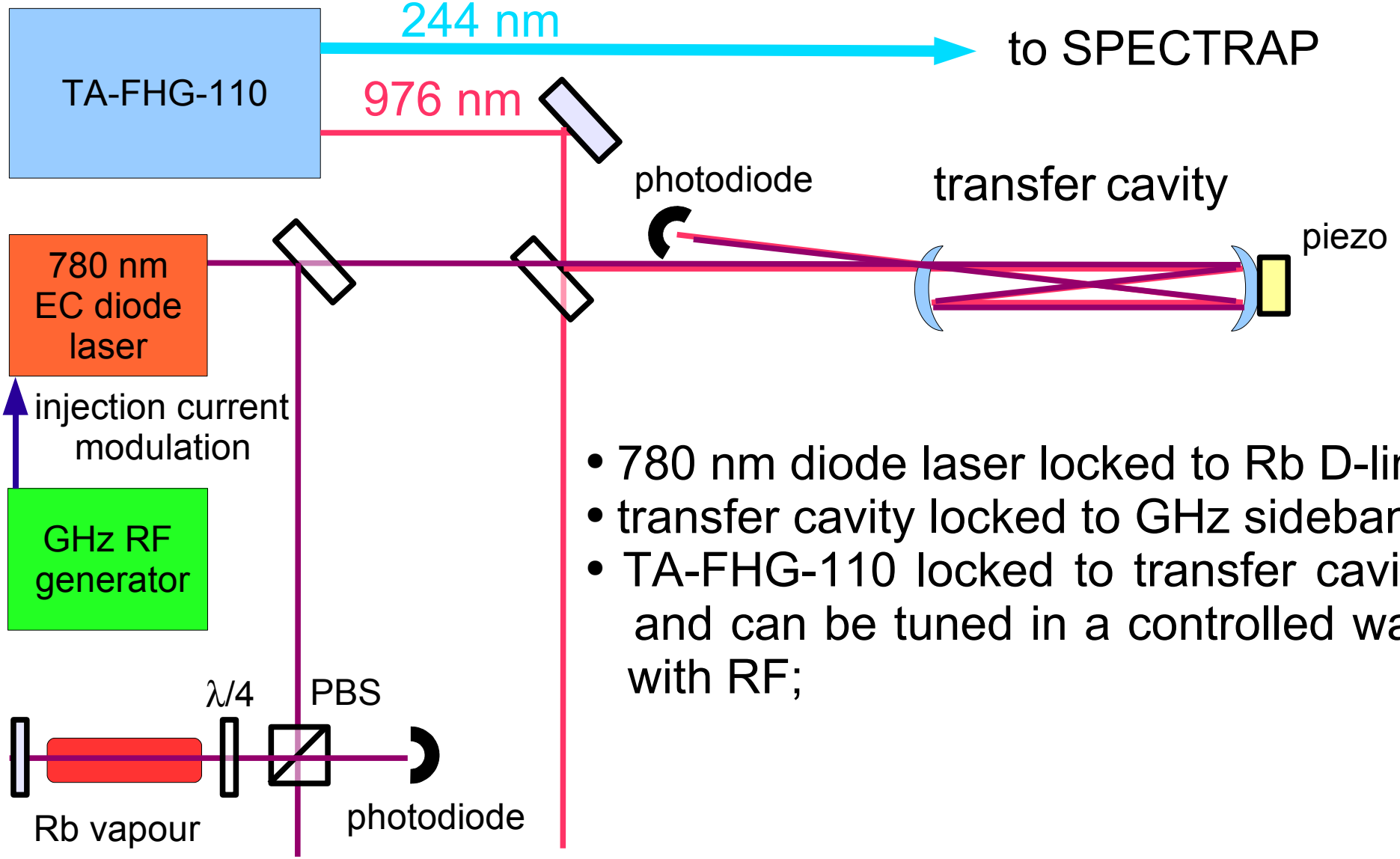


Specifications:

- output power 241-245 nm : 15 mW,
  245-246 nm : 10 mW;
- linewidth: < 4 MHz over 5 µs;
- mode-hop free scan range: typ. 25 GHz;
- doubling crystals: 1st doubling: $KNbO_3$,
  2nd doubling: BBO;
- Pound-Drever-Hall lock of 1st enhancement cavity,
  Hänsch-Couillaud lock of 2nd enhancement cavity;
- output of partial beam of 976 nm light and extensive control capabilities for MOPA frequency and power.

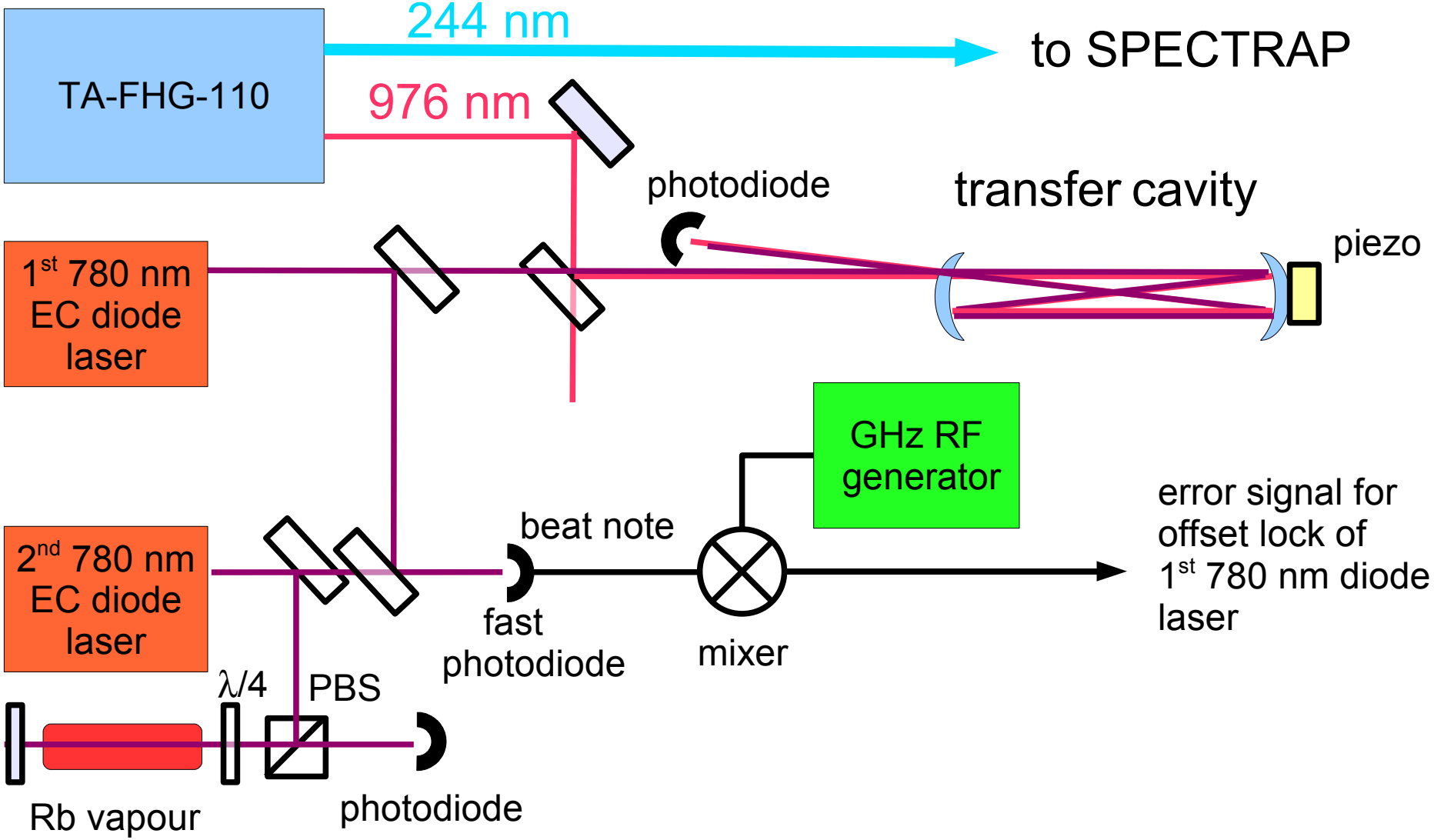
Delivery is scheduled for the coming 3 weeks.

Transfer cavity



- 780 nm diode laser locked to Rb D-line;
- transfer cavity locked to GHz sideband;
- TA-FHG-110 locked to transfer cavity and can be tuned in a controlled way with RF;

Transfer cavity



Frequency diagnostics

- low finesse FPI with large FSR (~10 GHz), to detect mode-hops when setting scan range;
- wavelength meter.