Enhancement cavities for continuous-wave / pulsed laser light

The passive enhancement of coherent laser light in an optical resonator leads to a power increase of a few orders of magnitude, which can be used e.g. to increase the conversion efficiency of nonlinear optical processes and/or to an increased sensitivity to absorption and chromatic dispersion, which can be used for metrology.

Applications include:

- XUV generation via HHG in a gas at MHz repetition rates
- Hard x-rays generation via Thomson (inverse Compton) scattering off relativistic electrons
- Longitudinal and transverse mode filtering
- Highly precise characterization of laser optics (amplitude and phase)

Fig. 1: Working principle of an enhancement cavity: the pulses of a MHz-repetition-rate train are coherently added up in time to a significantly more intense pulse circulating in the cavity. The cavity consists of an input coupler (R<100%) and several highly reflecting (HR) mirrors (R=100%).

We offer state-of-the art customized solutions for:

- Advanced cavity designs tailored to specific applications
- Stable enhancement cavities for repetition rates ≥10 MHz
- Enhancement cavities ready for average powers on the 100-kW level
- Broadband cavity optics
References:

