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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)

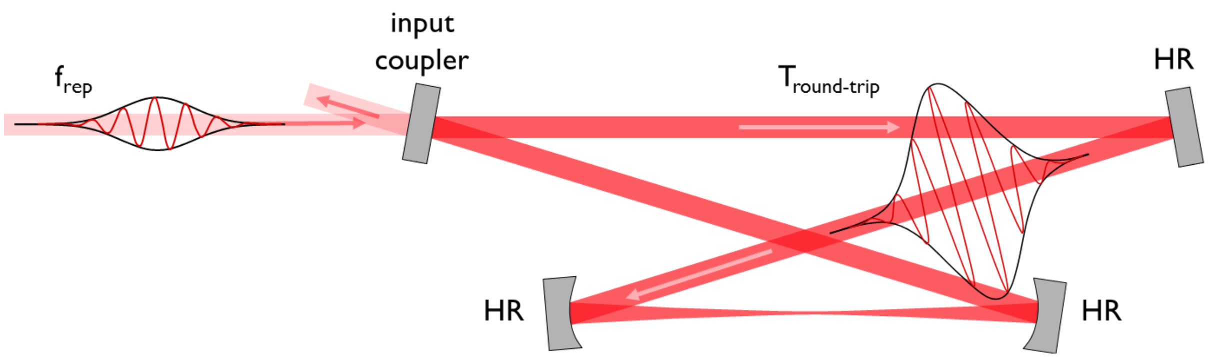

Fig. 1: Working principle of an enhancement cavity: the pulses of a MHz-repetition-rate train are coherently added up in time to a significantly more intense pulse circulating in the cavity. The cavity consists of an input coupler (R<100%) and several highly reflecting (HR) mirrors (R=100%).

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

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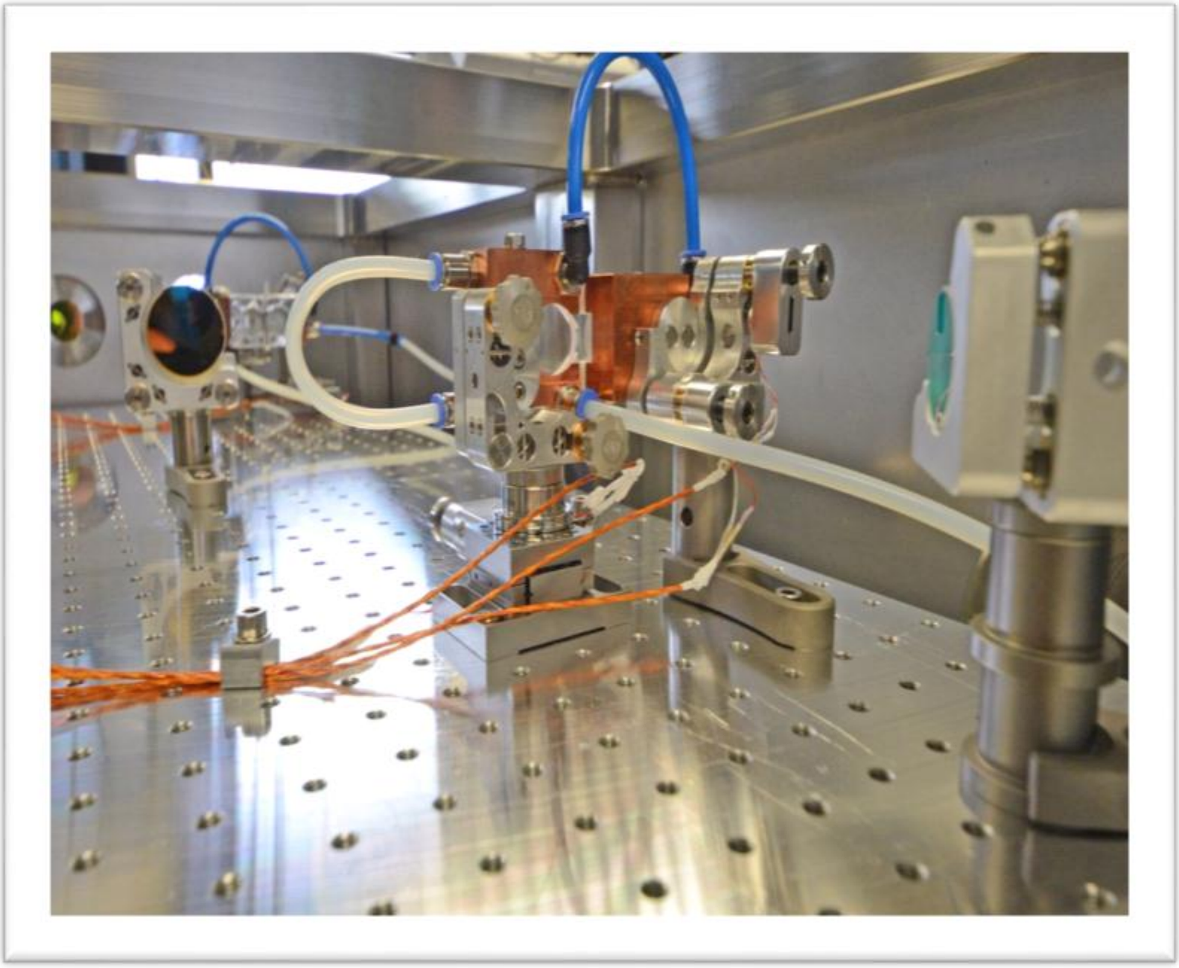

References:

I. Pupeza, T. Eidam, J. Rauschenberger, B. Bernhardt, A. Ozawa, E. Fill, A. Apolonski, Th. Udem, J. Limpert, Z. Alahmed, A. M. Azzeer, A. Tünnermann, Th. W. Hänsch, and F. Krausz, "Power scaling of a high-repetition-rate enhancement cavity," Optics Letters 35, 2052 (2010)

H. Carstens, S. Holzberger, J. M. Kaster, J. Weitenberg, V. Pervak, A. Apolonski, E. Fill, F. Krausz, and I. Pupeza, "Large-mode enhancement cavities," Optics Express 21, 11606 (2013)

I. Pupeza, S. Holzberger, T. Eidam, H. Carstens, D. Esser, J. Weitenberg, P. Rußbüldt, J. Rauschenberger, J. Limpert, Th. Udem, A. Tünnermann, Th. W. Hänsch, A. Apolonski, F. Krausz, and E. Fill, "Compact high-repetition-rate source of coherent 100 eV radiation," Nature Photonics 7, 608, (2013)