

Technology Offer

OPTICAL RESONATOR WITH GEOMETRICAL ACCESS TO THE OPTICAL AXIS

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Summary of the Technology

The invention relates to an optical resonator consisting of several mirrors, which determine the optical axis of the resonator. The resonator displays an obstacle in the optical path in form of a passage hole in one of the mirrors or an in- or de-coupling element. Such optical resonators can e.g. be used as enhancement resonators to produce high harmonics, which can be decoupled via the obstacle. A direct geometrical access to the optical axis enables the usage of the resonator for other applications. Those require the access in order to (de-)couple radiation into the resonator. In many cases dichroitic mirrors can facilitate the coupling without causing great losses for the circulating radiation. However, for many applications an access to the optical axis is desirable, e.g. in such cases as when light is supposed to be (de-)coupled with wavelengths being unsuitable for dichroitic mirrors. Usually, such a geometrical access causes losses restricting the enhancement of the resonator internal power. The losses for the circulating radiation can be minimized and high enhancements can accordingly be reached by an appropriate resonator design.

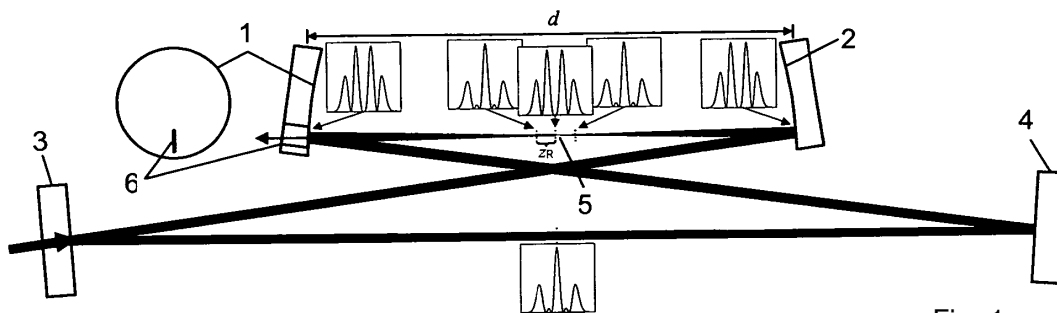


Fig. 1

**Fig. 1** shows such an exemplary ring design. The resonator consists of two curved mirrors 1, 2 (focussing mirrors) and two plane mirrors 3, 4. Mirror 3 serves as coupling mirror for the depicted radiation. By means of the mirrors 1, 2 a focal point 5 is generated between the two mirrors. The slit 6 in mirror 1 can be used to decouple the radiation out of the resonator. It grants access to the optical access which can be used e.g. for the decoupling of high harmonics.

Advantages

- Direct access to the optical axis
- Small radiation losses
- High enhancement



## Applications

- Enhancement resonator
- Thompson-Backscattering
- Production of coherent X-Rays
- Ultra precise spectroscopy
- Pump probe experiments
- Detection of vacuum polarisation

## Patent Information

PCT, US, EP

## Contact

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