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Title: Optical resonator for desktop type terahertz free electron laser, has mesh mirrors provided on electron beam incidence and emission portions in two-dimensional waveguide provided in undulator and refrigerated at very low temperature
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Abstract: NOVELTY - The resonator has a spiral shape undulator (70) that is supplied with cryogenic coolant such as liquid nitrogen or helium from exterior to evacuated thermal insulation layer metal box. The undulator is operated as electromagnetic coil to generate normal-conducting or superconducting magnetic field even in cryogenic environment. A two-dimensional cylindrical or rectangular waveguide (40) is provided inside undulator and is refrigerated at very low temperature. Mesh mirrors (45) are respectively provided on incidence and emission portions electron beam in waveguide.
USE - Optical resonator for desktop type terahertz free electron laser.
ADVANTAGE - The undulator and two-dimensional waveguide are used in the resonator so that the size the resonator can be reduced significantly. The diffracted loss between the mirror and two-dimensional waveguide can be suppressed effectively so that the gain the resonator can be improved efficiently.
DESCRIPTION DRAWING(S) - The drawing shows a sectional view the optical resonator.
Two-dimensional waveguide (40)
Mesh mirrors (45)
Insulation type cryogenic vessel (60)
Undulator (70)
Vacuum insulation cask (80)
Drawing:
Derwent Class Code(s): V08 (Lasers and Masers)
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