

Секция 7. Synchrotron Radiation: Sources and Applications  
Синхротронное излучение: источники и  
применение

7.01. SYNCHROTRON RADIATION SOURCES AND APPLICATION

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The synchrotron radiation finds wide applications in basic and applied research. In the report the review of existing and developed synchrotron radiation sources and the examples of use of synchrotron radiation in an industry, medicine, biology etc. are given. The questions of the basic parameters choice of synchrotron radiation sources - beam energy, current and emittance, magnetic structure, usage of the insertion devices are considered.

ИСТОЧНИКИ И ИСПОЛЬЗОВАНИЕ СИНХРОТРОННОГО  
ИЗЛУЧЕНИЯ

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Синхротронное излучение открывает широкие возможности для исследований во многих областях фундаментальной и прикладной науки и техники. В докладе приведены обзор существующих и разрабатываемых источников СИ, примеры использования синхротронного излучения в промышленности, медицине, биологии и т.д. Рассматриваются вопросы выбора основных параметров источников синхротронного излучения – энергия пучка, ток и эмиттанс, магнитная структура, использование специализированных вставок и т.п.

7.02. STATUS OF THE NOVOSIBIRSK HIGH-POWER FREE  
ELECTRON LASER

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A 100-MeV 8-turn accelerator-recuperator (AR) intended to drive a high-power infrared free electron laser (FEL) is under construction in Novosibirsk now. The FEL will provide up to 100 kW CW in the region of 3...10 microsec. As building of the full-scale machine takes a long time and many resources, it is reasonably to divide the project to two stages. The first-stage machine includes the AR with the full-scale RF-system and only one turn of electron beam, so the maximum energy of electrons is 14.5 MeV. A submillimeter-wave FEL will be installed on the single backward track of the AR. The expected FEL parameters are: wavelength of emitted radiation 100...200 microsec; pulse duration 20...100 ps; peak power 1...7 MW; average power 0.6...7 kW. Thus, we get an operating FEL after commissioning the first stage of the project. Various aspects of these two projects and possible applications are discussed.