**Proposal of a Compact High Brightness Laser Synchrotron Light Source for Medical Applications**, K. NAKAJIMA, H. NAKANISHI, A. OGATA, KEK; M. KUMADA, ZHANG FENG-QING, NIRS - The present high-brightness hard X-ray sources have been developed as third generation synchrotron light sources based on large-scale high energy electron storage rings and magnetic undulators. Recently availability of compact terawatt lasers referred to as table-top-terawatt lasers based on chirped pulse amplification arouses a great interest in the use of lasers as undulators of which a period is 10000 times shorter than the conventional undulator. This feature of laser undulators allows the use of 100 times less energetic electrons to generate X-rays of a particular wavelength. The laser undulator concept lasers makes it possible to construct an attractive compact synchrotron radiation source which has been proposed as a laser synchrotron light source. A compact high brightness hard X-ray source is an essential tool for medical applications in a hospital, such as an intravenous coronary angiography and microbeam therapy. This paper proposes a compact laser synchrotron light source for a medical use, consisting of a laser storage ring and a low energy electron storage ring.