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HIGHLIGHTS OF THE MEXICAN SYNCHROTRON DESIGN

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Abstract

In the design of a synchrotron light source, it is required to put together many important pieces. It is important how magnets are chosen in the right order to guarantee that electrons are turning around the central orbit for long periods of time. Different models are being proposed to upgrade synchrotrons. This presentation will address some ideas developed during the last synchrotron upgrades. Some of these upgrades are the 9BA concept in ALS-U, the hybrid model in EBS-ESRF and the use of anti-bends in SLS-2. They have been considered as possible models for the Mexican synchrotron design. A more thorough study should give insight on the motion of electrons affected by nonlinear dynamic, that comes into play once the chromaticity is corrected. Some codes help to achieve this task, but they present some problems. In reference to minimizing the nonlinear dynamic effects in phase space, a partially elaborated technique is described in this presentation which we think will be useful to increase the dynamic aperture. The method treats the non-linear dynamic of the particles in the synchrotron, by optimizing the parameters of the multipoles that generate such complex behavior. All this is linked to a process of approximating the non-linear problem to the corresponding linear problem by using quasi-invariants.

About

Hizo su doctorado en física matemática en la UNAM. Posteriormente hizo un posdoctorado en Brookhaven National Laboratory donde tuvo la oportunidad de trabajar en física de aceleradores en el AGS y en el proyecto del Relativistic Heavy Ion Collider. Regresó a la Universidad de Guanajuato para participar en la creación de su Instituto de Física y en el programa de posgrado correspondiente. Ya en el ICF, se unió en 2007 al grupo nacional que proponía la creación de una fuente de luz sincrotrón en México y desde entonces ha estado ligado a este proyecto participando principalmente en su diseño. Ha colaborado con grupos de biofísica y de física atómica del ICF en el desarrollo de un compuesto farmacológico derivado de la anfotericina B y en modelos de propiedades de membranas lipídicas, así como en experimentos de espectroscopía atómica en líneas de radiación sincrotrón.

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