

incensements of the emittance caused by IBS, and the influence of beam parameters on the growth rate of IBS, which assists in qualitative and quantitative analysis for the intra-beam scattering effect. Further emittance reduction to the level of DLSRs requires a damping wiggler in a region with zero dispersion. The wiggler parameters must be optimized in order to achieve maximum damping efficiency. Touschek lifetime relies strongly on the 6D emittance: it grows with increasing longitudinal emittance which makes higher harmonic cavities for bunch lengthening attractive. Furthermore, the emittance blow up from IBS is also reduced, because they increase the bunch length of the bunch. We evaluate the performance of harmonic RF systems and their interaction with all longitudinal beam dynamics under various operations, we also do some simulations by means of the particle-tracking method. Meanwhile, we do particle tracking for simultaneous long and short electron bunches in the BAPS storage ring by using two harmonic RF systems with different frequencies. A number of possible instabilities and an estimate of their impact on the ring performance are briefly surveyed. The effects considered include fast beam-ion instability, coherent synchrotron radiation, and so on.

## **5 Forthcoming Beam Dynamics Events**

### **5.1 International Conference on Cyclotrons and their Applications (Cyclotron2016)**

The 21st conference in this series will take place from September 11 to 16, 2016 at the Federal Institute of Technology in Zurich, Switzerland.

The International Conference on Cyclotrons and their Applications has a long and healthy history, dating back to the 1950s. The conference takes place every 3 years with the most recent events being held in Vancouver/Canada (2013) and Lanzhou/China (2010). The 2016 edition will be hosted by the Paul Scherrer Institute, PSI, and the Swiss Federal Institute of Technology, ETH. The program covers cyclotron technology, theoretical and numerical aspects of beam dynamics, new concepts, operational aspects of cyclotrons, together with their applications.

The conference will be held in the historic settings of ETH Zurich. There are numerous sights in the former Roman city of Zurich at which you can marvel. You find architecture highlights, historical squares, streets and districts, churches, artworks and lots more. Thanks to its central location in the very heart of Europe, it is easy to reach by plane or train, and it also boasts a first-class infrastructure and public transportation system. The Paul Scherrer Institute is located about 30km from the venue and participants of the conference will have the opportunity to visit the accelerator facilities at PSI, including a number of cyclotrons. The workshop website

<http://www.cyc2016.ch>

will be regularly updated to include the latest information as it becomes available.

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