



Contribution ID : 700

Type : **Oral presentation**

Crab cavities for colliders - past, present and future

Friday, 4 July 2014 10:25 (15)

The numerous parasitic encounters in the LHC are mitigated by introducing a crossing angle between beams. Crab cavities would allow restoring head-on collisions at the interactions point, thus increasing the geometric luminosity. Crab cavities would also offer a mechanism for luminosity leveling.

KEKB was the first facility to implement the crab crossing technique in 2007, for the interaction of electron and positron beams. The High Luminosity Large Hadron Collider (HL-LHC) project envisages the use of crab cavities for increasing and leveling the luminosity of proton-proton collisions in LHC. And crab cavities have been proposed and studied for future colliders like CLIC, ILC and eRHIC.

We will review in this paper the past, present and future of crab cavities for particle colliders.

Summary

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Session Classification : Accelerator Physics and Future Colliders

Track Classification : Accelerator Physics and Future Colliders