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Diamond Detectors for beam instrumentation

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Diamond is perhaps the most versatile, efficient and radiation tolerant material available for use in beam detectors with a correspondingly wide range of applications in beam instrumentation. Numerous practical applications have demonstrated and exploited the sensitivity of diamond to charged particles, photons and neutrons. In this presentation, emphasis will be given to fast beam loss monitoring at the LHC and to neutron detection, where diamond can potentially be used as an He-3 replacement.

Summary

Diamond detectors have proven to be useful as fast beam loss instrumentation. At the LHC bunch-by-bunch losses are resolved and lead to new insight into the behaviour of the accelerator. Recent research has shown that diamond is also a proper candidate for neutron detection, where it proves to be a potential candidate to replace He-3 in the future.

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