

Controlling thermal deformations

Monday 23 May 2016 15:00 (30 minutes)

For the LHCb silicon detector modules or VeloPix modules, thermal stability is an important issue. The sensors are being cooled down over a gradient of 50 degrees Celsius. Early prototype tests showed that the thermal deformation is in the sub millimeter range while the requirements only allow a few microns of movement. It is assumed that this issue is caused by different thermal expansions. To minimize this deformation a design is made that uses Borosilicate glass to match the coefficient of thermal expansion to that of Silicon and at the same time have a function as a thermal insulator. This prevents other materials from having a temperature gradient.

The presentation will go into detail in the following subjects; the material selection, the temperature depended properties, simulations and experiments.

Summary

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