

CO₂ cooling

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Abstract

Evaporative CO₂ is a very interesting cooling fluid for particle detectors and perhaps other scientific instruments. The cooling pipes needed for CO₂ are significantly smaller than the pipes needed for other refrigerants. The heat and mass transfer properties of CO₂ are very good.

CO₂ is applied successfully in the LHCb-VELO and AMS-Tracker experiments. Both systems use the Nikhef developed 2PACL (2-Phase Accumulator Controlled Loop) method for circulating and conditioning the CO₂ in the experiments. This method allows for a high temperature stability in the detector and is relatively easy to build and control.

This seminar will show the benefits of using CO₂. It will show the test results from the LHCb and AMS detector. It will also show the future plans we have with CO₂ cooling for upgrade or new high energy physics detectors.