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Gas measurements in a sealed TPC for the HARPO experiment

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The HARPO detector is a demonstrator of gamma-ray detector and polarimeter, for a potential space telescope. It is a (30cm) 3 cubic TPC filled with high pressure (up to 4bar) Ar:isobutane mixture. It has been tested with cosmic rays and in a high intensity gamma-ray beam.

The TPC data, in particular from cosmic rays, can be used to monitor the gas properties (gain, drift velocity and electron attachment). The TPC was sealed for several months with the same gas to study its long term stability. A lightweight system for recirculation and purification of the gas was installed and tested.

We will show the results and experience with this system, in particular on the gas evolution over several month.

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