## Contribution submission to the conference Münster 2017

GEM discharge protection with a resistive copper oxide layer

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For the International Large Detector (ILD) at the planned International Linear Collider (ILC) a Time Projection Chamber (TPC) is foreseen as the main tracking detector. The gas amplification will be done by Micro Pattern Gaseous Detectors (MPGD). One option is to use Gas Electron Multipliers (GEM). While the applicability of GEMs for the gas amplification in a TPC readout has been shown, the focus of the current research is to study the discharge processes and improve the long term high voltage stability of the readout modules. This is a crucial requirement for the operation in the final ILD TPC.

The main focus of the research presented in this talk is on studies of the discharge stability and operational features of large area 22x18cm<sup>2</sup> GEM foils. A novel treatment of the GEM foils by applying a resistive layer of copper oxide will be presented. The impact of this treatment on the high voltage stability and the GEM performance will be discussed. First results from using these GEMs in a prototype TPC will be presented.

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