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GridPix: the ultimate electron detector for TPCs (in-person)

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By means of "Integrated Grid"**InGrid** MEMS technology, a MicroMegas is created on top of the (spark protected) TimePix-3 chip. Units containing four chips "Quads"and their services (data and control transfer, power, cooling) can be placed together, forming an arbitrarily large active direction area. Data from UV laser tracks, from cosmic ray muons, and from test beams are presented.
By applying 1.4 % CS2 in the gas, the drifting electrons form drifting negative ions of which the ***two*** drift velocities are measured with high precision. Negative ion TPCs can self-provide Tzero for tracks, which is convenient in rare-event experiments.
An outlook is presented on applying the future TimePix-4 in the electron GridPix detector.

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