**CERN-BINP** workshop for young scientists in e+e- colliders



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## GEM detectors in the experiments at e+e- colliders in BINP

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Micro-pattern gaseous detectors, on the one hand, possess a high spatial resolution in tens micron scale together with high rate capability and, on the other hand, they have all advantages of gaseous detectors, such as relatively low cost per unit area, possibility of large area coverage as well as a uniform and cheap gas converter. These detectors are considered as possible candidates for a number of tracking systems of the future Super ctau factory experiment and, thus, this technology might be very promising. Cascaded Gas Electron Multiplier (GEM) based detectors are used in the collider experiments at the Budker Institute of Nuclear Physics, and being developed for a number of new projects. The system of 8 triple-GEM detectors is under operation at the tagging system of the KEDR experiment at the VEPP-4M collider since 2010. The detectors allow for tracking accuracy of about 70 microns and have no losses of efficiency at the local rate up to 1 MHz per squared cm. New triple-GEM detectors with a very low material budget of about 0.25% X0 have been developed for the DEUTRON facility at the VEPP-3 storage ring. These detectors have demonstrated spatial resolution better than 50 microns with 1 GeV electrons. The upgrade of the tracking of the CMD-3 detector is planned based on cascaded GEMs. The development of the end-cup discs and central cylindrical chamber is being started. The discs will be based on the triple-GEM cascade and will have diameter of 50 cm. The design of the cylindrical chamber is under discussion and it will be probably based on the new micro-pattern structure, resistive micro-WELL. It will have diameter of more than 60 cm and will be about 60 cm long.

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