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The INSULAB beam test setup

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The INSULAB beam test setup is made up by different detectors for precision tracking, trigger setup, multiplicity counting and energy measurements. The tracking system consists in a set of double-sided microstrip silicon telescopes with a high spatial resolution (˜ 5 um) and large area single-sided microstrip silicon detector (resolution down to ˜ 30 um) for the precise measurements of the incoming particles tracks and the beam divergence; different plastic scintillators read out by PMTs are suitable for the trigger system and to be used as multiplicity counters; a set of electromagnetic calorimeters (homogeneous BGO or Lead glass and sampling lead-scintillator shashlik) read out by PMTs for a precise energy measurements (with energy resolution down to 5%/sqrt(E) TBC) of photons or electrons/positrons. The detectors are read out by custom VME boards (silicon detectors) or commercial digitizers of the CAEN V1730 family (scintillators or calorimeters).

The data acquistion, written in C with Tcl/Tk as GUI, allows to program and monitor different trigger configurations, acquire data and process them online with a stripping system producing DST (summary files) with all relevant informations suitable for easy data analysis in ROOT or python. There is undergoing work to improve the interconnection of modules (optical fiber readout of silicon detectors) and to develop custom digitizers to improve the acquisition speed.

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