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The ZEUS Global Tracking Trigger Barrel Algorithm

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The current design, implementation and performance of the ZEUS global tracking trigger barrel algorithm are described. The ZEUS global tracking trigger integrates track information from the ZEUS central tracking chamber (CTD) and micro vertex detector (MVD) to obtain a global picture of the track topology in the ZEUS detector at the second level trigger stage. Algorithm processing is performed on a farm of Linux PCs and, to avoid unacceptable deadtime in the ZEUS readout system, must be completed within the strict requirements of the ZEUS trigger system. The GTT plays a vital role in the selection of good physics events and the rejection of non-physics background within the very harsh trigger environment provided by the upgraded HERA collider. The GTT barrel algorithm greatly improves the vertex resolution and the track finding efficiency of the ZEUS second level trigger while the mean event processing latency and throughput are well within the trigger requirements. Recent running experience with HERA production luminosity is briefly discussed.

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