Field propagation – beyond integration

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Accuracy of intersection

- Parameters related to accuracy of boundary crossing
  - delta chord is maximum sagitta – a volume intersection could be missed
  - delta_intersection is maximal displacement from curve to chord (bias limiting value)

- Default Parameters settings
  - Default value of $\delta_{intersection}$ (bias limiting value)
  - Is value of δ_{chord} parameter too large for typical HEP applications (0.25mm) ?

Accuracy of intersection (part 2)

- Requests of ALICE and CMS to provide better defaults for HEP
- Actions
  - Identify good default values for these parameters (polling LHC experiments)
  - Prototype new heuristics for reducing/eliminating the need for these parameters

Robustness of propagation

- Several recent reports of issues with field propagation
  - DW (Dennis): G4MagInt_Driver::AccurateAdvance: Proposed step is zero; hstep = 0 !
  - Problem 2144 – **Neutral primaries particles killed** after looper aborts previous event. Fixed
  - **Problem 2186 - Abort Trap 6 in G4MultiLevelLocator**
  - Problem 2188 - **Events not independent due to magnetic field + looper thresholds kill primary particle in all subsequent** events – since Geant4 10.5 (including 10.5.p1). BDSIM use cases. Open
- Created whiteboard class to investigate issues related to the behavior of Multi-level locator which seems strongly related to issues DW and 2186.