SoLID Software & Track Reconstruction Update

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SoLID Collaboration Meeting
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General Analysis Software (C++ Analyzer) Status

Rel	Task	Status	Time (weeks)	Sum
1.6	Split libraries into core and Hall A parts	Not started	2	
	Integrate Hall C changes	Not started	1	
	Object-oriented decoder	Not started	4	
	Event-type handler plugins	About 50% done	4	
	Abstract database API design	About 80% done	1	
	Modify all modules for new database API	Not started	2	
	Change all classes to TTimeStamp	Not started	1	
	Remove binary-compatibility workarounds	Not started	1	
	Implement test & validation procedures	Partly done (25%?)	4	
	Set up bug-tracking system	Not started	2	22
2.0	Automatic parallelization	Researched (10%)	10	
	ROOT output file speed improvements	Not started	6	
	Decoders for 12 GeV electronics	Some (10%?)	8	
	CODA 3/EVIO 3 support	Not started	2	
	SQL database backend	About 25% done	4	
	VDC multicluster analysis	About 75% done	3	33

TreeSearch Tracking for SoLID: Tasks

- Make code modifications
- Find tracks for field-free and background-free case
- Investigate effect of field, track curvature
- Optimize parameters, esp. road width
- Turn on background
- Get rough numbers for
  - tracking efficiency
  - ghost track rate
  - performance
- Conclude if algorithm suitable

TreeSearch Tracking for SoLID: Tasks Completed

- Make code modifications ($\approx 80\%$)
- Find tracks for field-free and background-free case
- Investigate effect of field, track curvature
- Optimize parameters, esp. road width
- Turn on background
- Get rough numbers for
  - tracking efficiency
  - ghost track rate
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TreeSearch Code & Algorithm Modifications (to be) Made for SoLID

- Support SoLID geometry
  - Allow downstream tracker planes to be asymmetric w.r.t. first plane
  - Support detector positioning in cylindrical coordinates
  - Cut on non-rectangular active detector area
  - Create database for simulation input
- Incorporate all sectors in a spectrometer class
- Allow for (small) track curvature in 2D and 3D fits
  - Need efficient algorithm
  - Implement parameter range limits
  - Stability?

Conclusions

- Progress on general analysis software (important in long run)
- Need another $\approx$ 6–8 weeks (assuming 75% time commitment) for TreeSearch tracking results
- Possibly more to investigate track curvature issues in depth
- Could use help from postdoc/student to speed up work. Must be experienced with C++ software.