

Embedding PID Code in LCD/JAS Structure

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July 15th, 2003

Embedding **New** Code in LCD/JAS Structure

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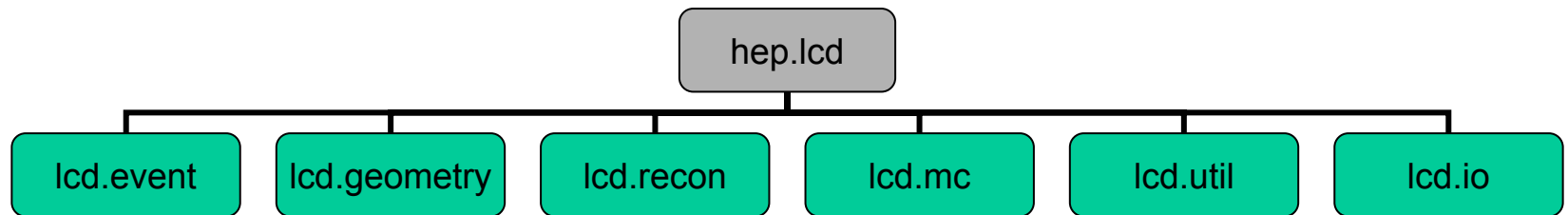
PID Group s/w Effort

- **LCRD proposal for PID software infrastructure funded**
 - New grad. Student: **Sky Rolnick**
 - New undergrad./programmer: **John Cairns**
- Current task, determine how to embed PID in the overall LCD/JAS s/w infrastructure - impasse
 - *Main discussion today.*
- **FastMC**
 - Emphasis on dE/dx tools –restructuring to separate fast sim./smearing vs. generic recon
 - Checking existing code for correctness e.g. Helix, dE/dx models
 - Add fast/slow Muon system's simulation/reconstruction components
- **Cross subsystem PID**
 - Methods for combining sub-system information – $\ln(\text{Likelihood})$

General Issues

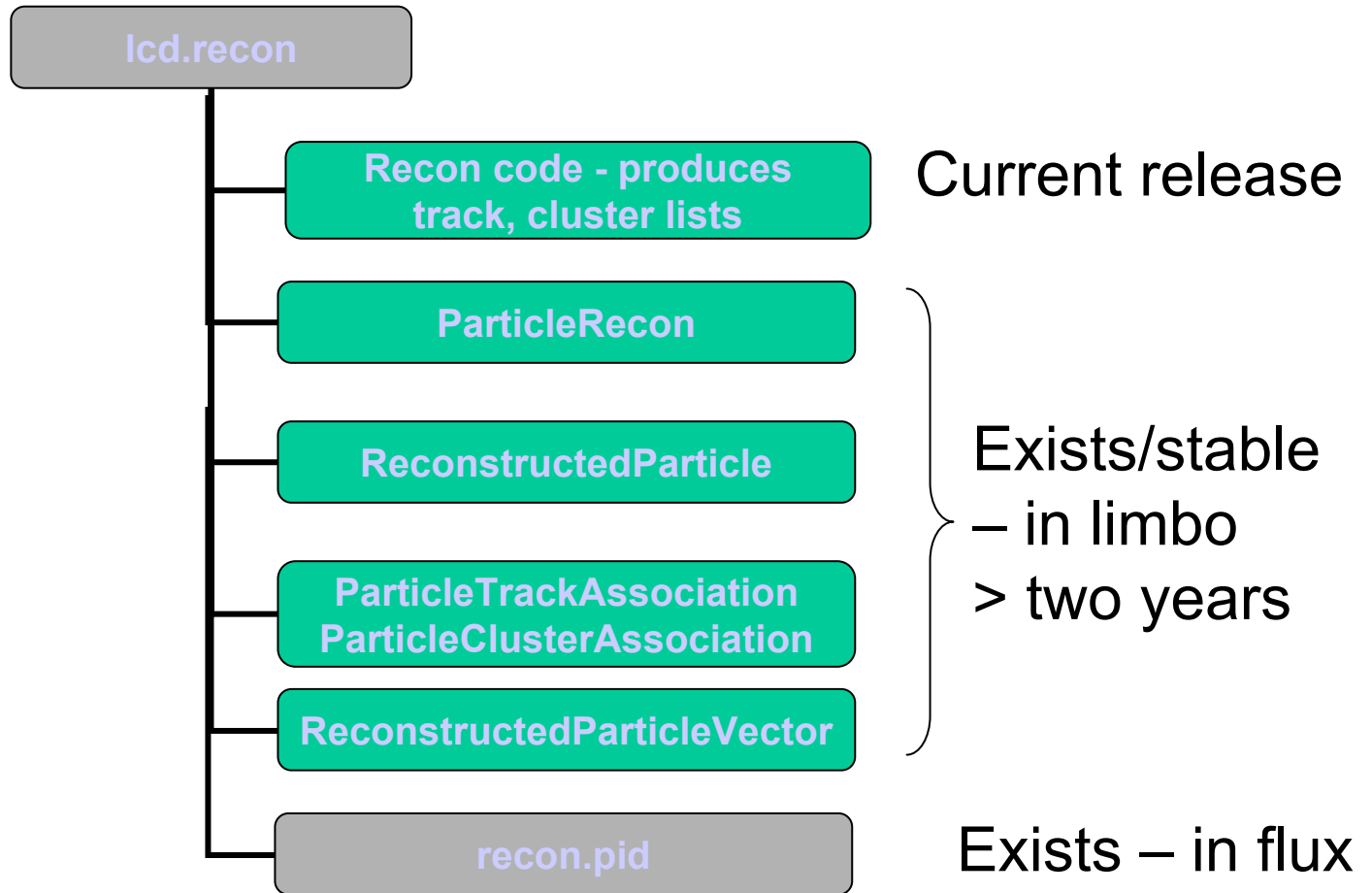
- **Particle ID requires a broader s/w infrastructure design than is in the current JAS/LCD distribution**
- **E.g. `ReconstructedParticle` class would facilitate development and use by broader community**
 - Natural end result of reconstruction e.g. merging tracks and calorimeter clusters
 - Natural place to add Particle ID information (`PidInfo` class?)
 - Encourage access to “track” or “cluster” information through the `RP` class
- **What should be in the `ReconstructedParticle` class?**
- **What should be in the `PidInfo`? E.g. best ID, all particle likelihoods, contributing subsystem likelihoods...?**
- **How should `LCDEvent` be used?**
 - Currently, a “catch-all” object to be passed along the event loop
 - Useful for prototyping, but skirts any overall design

HEP.LCD



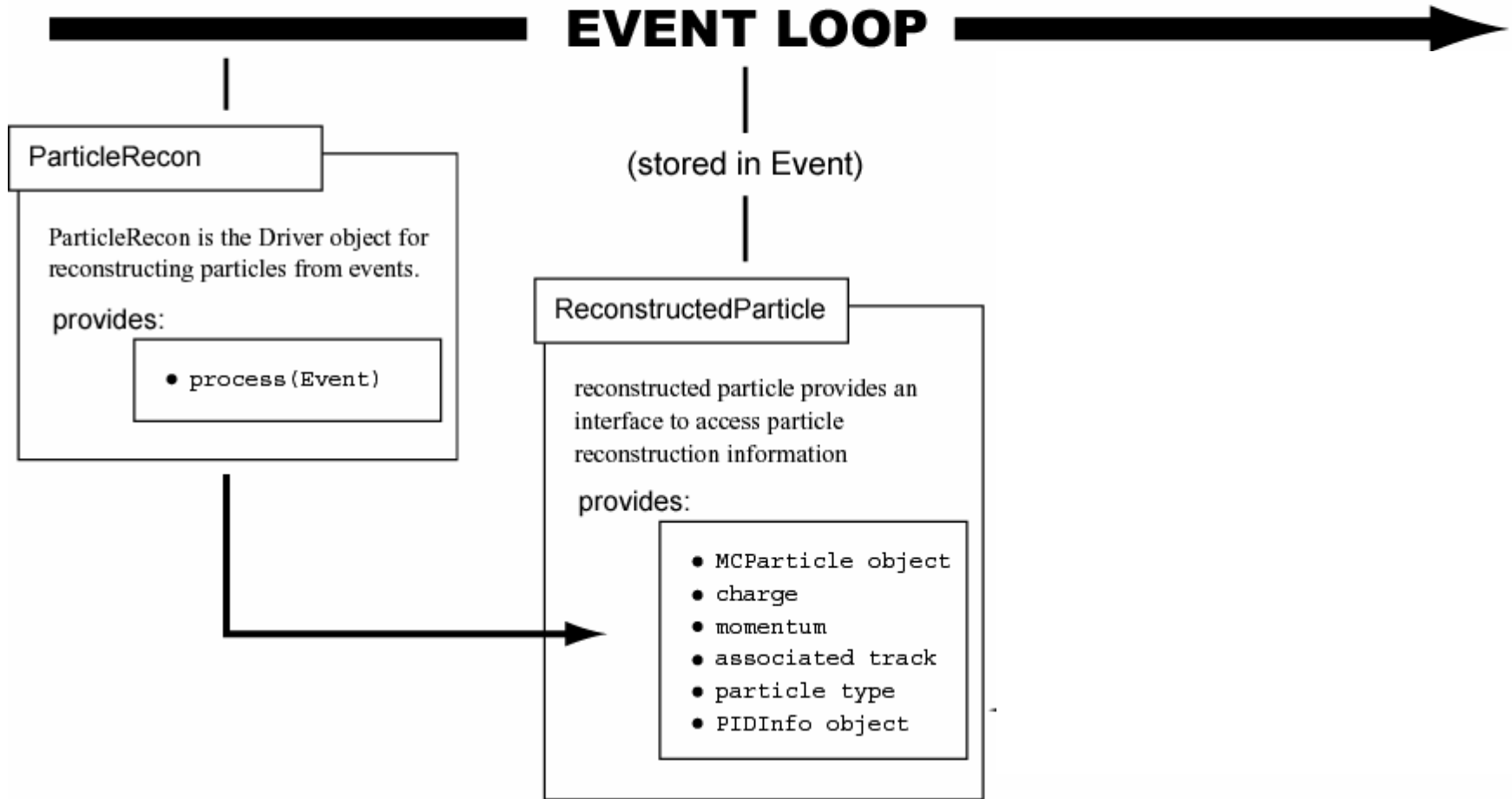
Global detector PID crosses subsystems and
lcd s/w categories

LCD.RECON



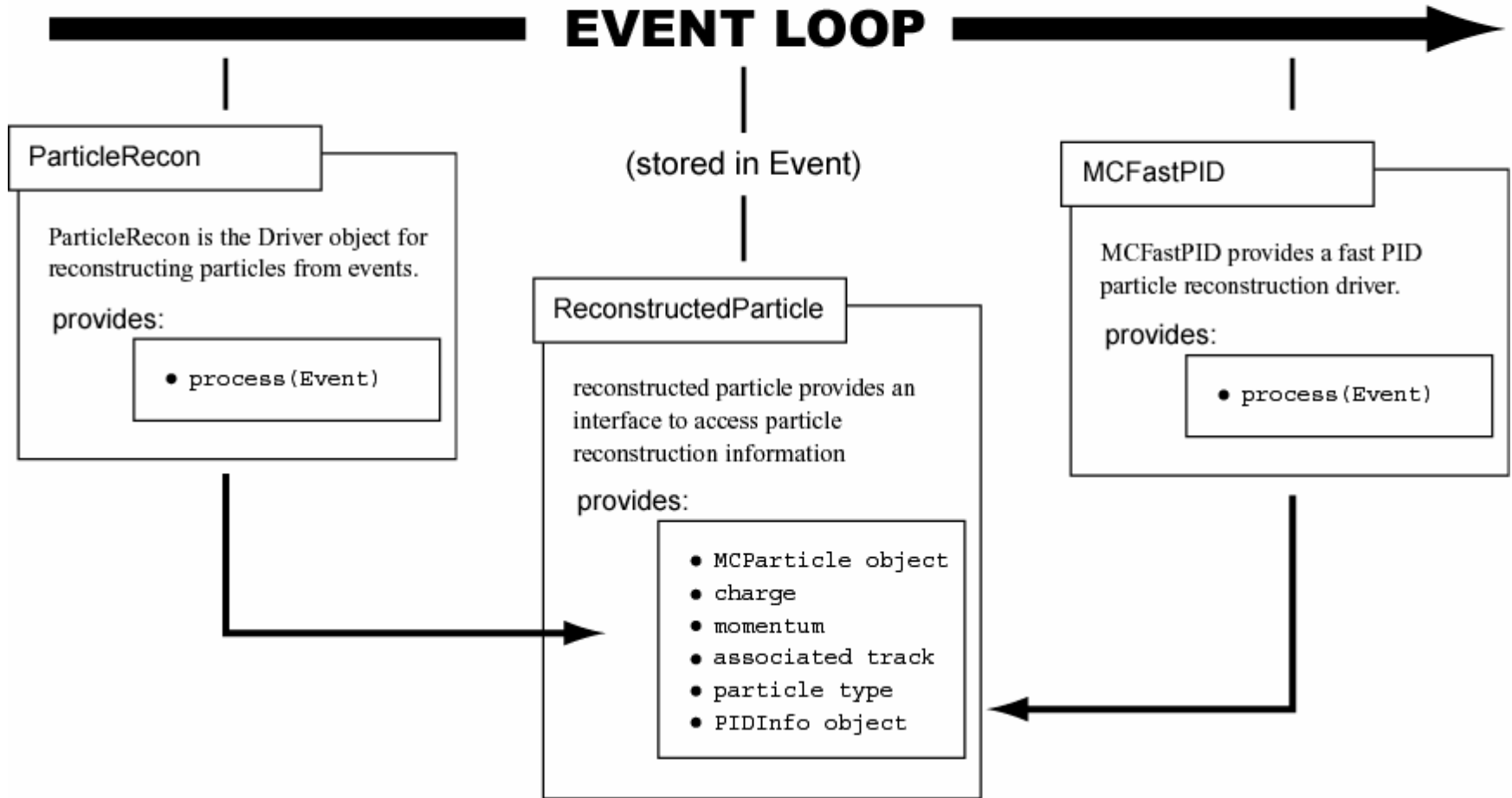
Important Reconstruction Classes

(Current Implementation)



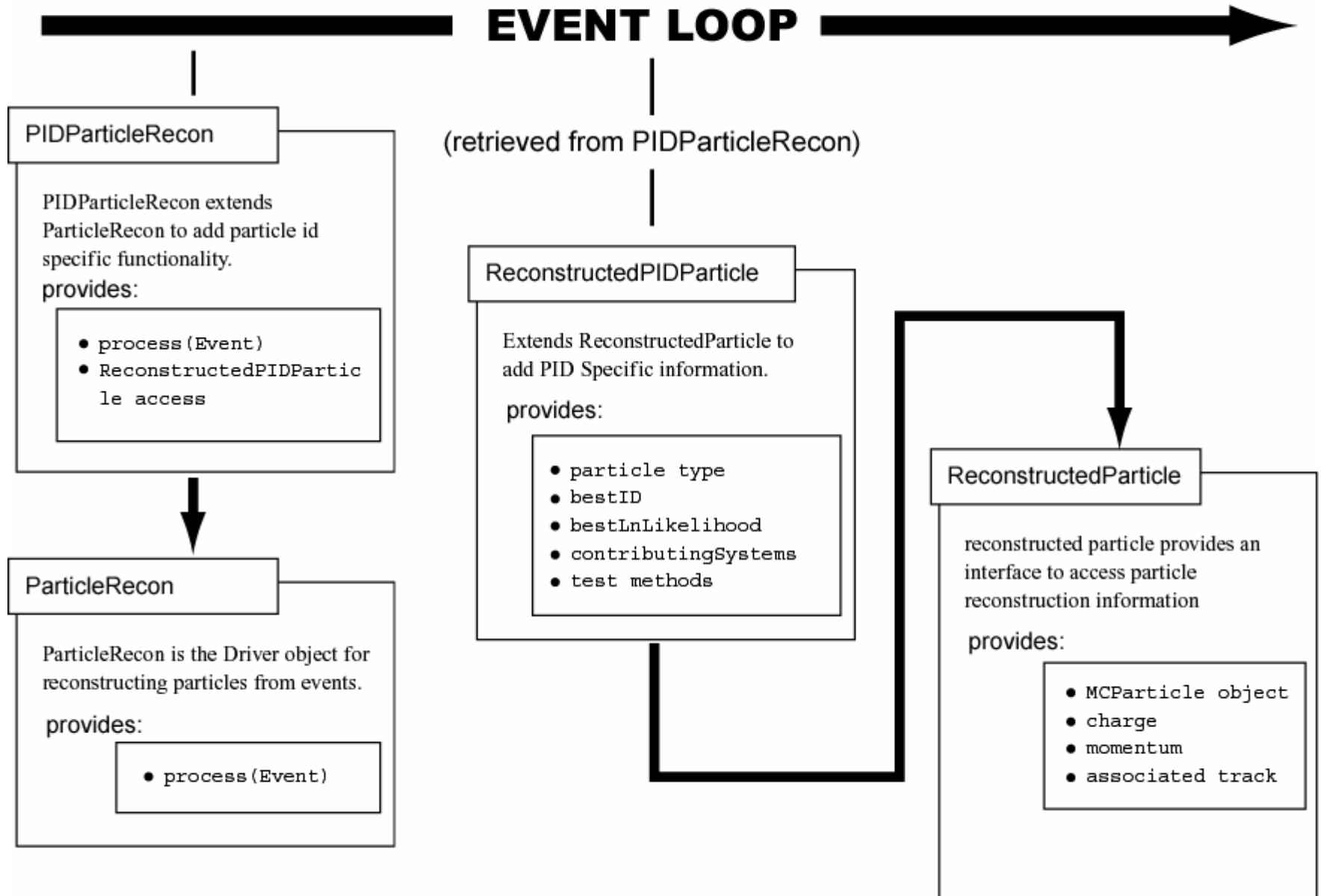
Important Reconstruction Classes

(Current Implementation)



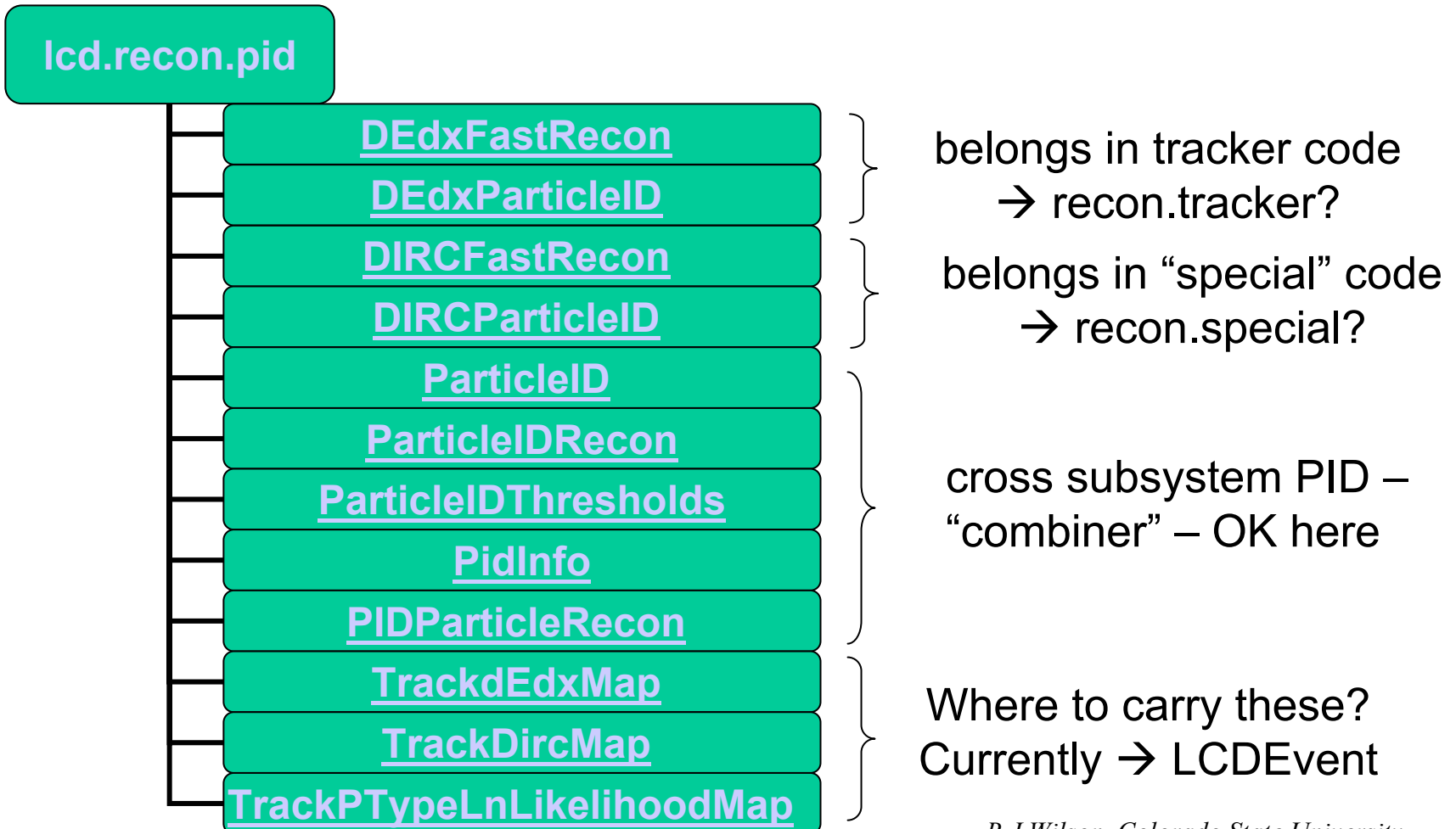
Important Reconstruction Classes

(Example alternate Implementation)

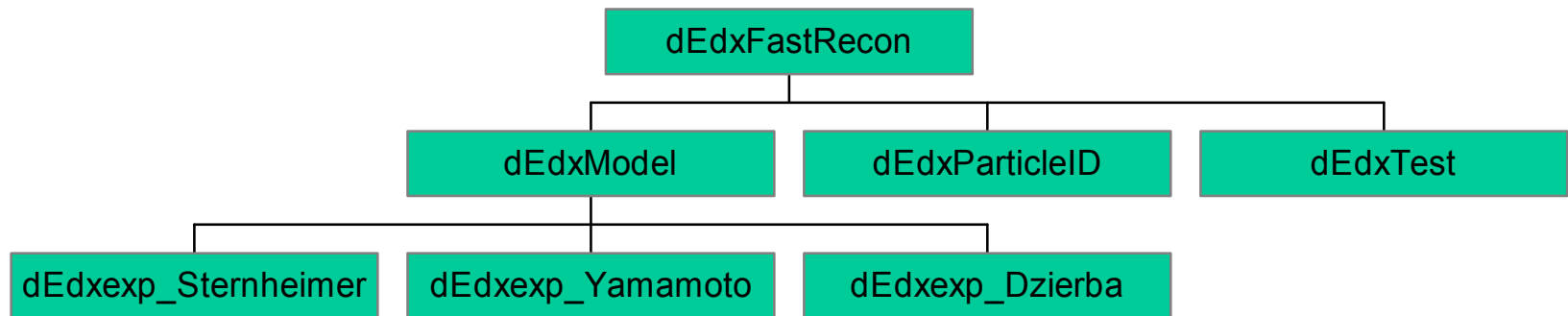


LCD.RECON.PID

Anything vaguely connected with PID dumped in here



Restructuring dEdxFastRecon



Summary

- Cross subsystem Particle ID implementation at an impasse
 - E.g. ReconstructedParticle and PID code existing “on the fringe” for long time
- To take best advantage of outside contributors ...
 - Guidance/consultation on the s/w design/architecture
 - Clear mechanism for review and subsequent inclusion in LCD code releases (CVS a good step in that direction)