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AIDA infrastructure for a tungsten/scintillator HCAL prototype

This document is meant as basis for discussion about creating a possible infrastructure for compact tungsten/scintillator HCAL prototyping within the AIDA project. The project shall allow for providing a generic infrastructure for a compact ILC or CLIC hadron calorimeter, based on particle flow. It will allow to address crucial requirements for the next generation of linear collider detectors, such as compact readout integration, power pulsing, calibration systems, manufacturability, cooling and services.

Item	**AIDA infrastructure[1]**	**Own R&D[2]**
Scintillator and SiPM optimisation		*
R&D on fast optical signal, compatible with time-stamping		*
Mechanical integration of scintillator plane	*	
Readout electronics	*	
Integration of readout electronics	*	
Power pulsing	*	
Active power supply	*	
Signal calibration system	*	
Purchase of tungsten		*
Mechanical manufacturability of tungsten stack	*	
Detector cooling studies	*	

Although the Tungsten absorber stack (~12 mm tungsten plates) and the Integrated scintillator planes (fitting into ~8 mm radial space) are presented together, for internal purposes they can well be seen as separate developments. The integrated scintillator planes form a next development stage of the HCAL for ILC, including next-generation electronics, integration issues, power pulsing, cooling etc. The tungsten stack is currently mostly motivated by CLIC, as it provides a compact solution for a deep calorimeter. For the thick tungsten plates manufacturability issues like QA, cutting, machining, threading and assembly procedures will be assessed. The more compact tungsten structure, as compared to steel favored for ILC energies, poses more challening requirements for the integration of electronics interfaces, whjch are also addressed in this project.

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