



Project Summary Report

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Reporting Period	<input type="checkbox"/> January 2006 – December 2006 <input type="checkbox"/> January 2007 – December 2007 <input type="checkbox"/> January 2008 – December 2008 <input type="checkbox"/> January 2009 – December 2009 <input checked="" type="checkbox"/> January 2010 – December 2010

Project Number	BTELE-2010-08
Project Title	SPiDeR (Silicon Pixel Detector R&D) Collaboration: DECAL subproject
Project Objective (max 250 words)	The SPiDeR collaboration is investigating monolithic CMOS pixel sensors for future collider detectors, in particular high energy lepton colliders (ILC and CLIC). The collaboration is studying both fundamental technologies for future detector sensors and also novel applications of CMOS sensors. These could be applied both to tracking and calorimetry. In particular, the collaboration is studying the feasibility of a digital electromagnetic calorimeter (DECAL). The DECAL would be a new approach to electromagnetic calorimetry where the initial electron or photon energy is estimated by counting particles rather than from the deposited energy. The specific BTELE-2010-08 project which took data in September 2010 was to measure electromagnetic core shower densities at high granularity ($\sim 20\mu\text{m}$) using the EUDET telescope sensors.
Project Achievement (max. 250 words)	Tungsten sheets of various total thickness were inserted between the front and back three layers of the EUDET telescope. A large electron beam dataset was acquired, varying the beam energy from 10 to 100GeV, using between 2 and $15X_0$ of tungsten (as well as with no tungsten), for a total of around 50 configurations. This covers the energy range relevant to ILC/CLIC studies and the material range from below to well above shower maximum. The dataset for each configuration averaged 50k events. The data are still under analysis but preliminary results so far indicate that the dataset is definitely of high quality and will be publishable.