1 Solid-State Luminosity Calorimeter (SICAL)

(Sept. 1992)

Description: Cylindrical calorimeter mounted on each side of the interaction region. Each calorimeter is assembled from two half-modules enclosing the new beam pipe, and consists of 12 tungsten sheets alternating with layers of silicon pads. Successive layers of silicon are rotated in phi by one-third of the pad size (3.75^0).

Dimensions:

Radius:	$R_{inner} = 6.0$ cm	
	$R_{outer} = 14.6$ cm	
Distance from I.P.	$z = 250.23$ cm	
Thickness	$\Delta z = 12.41$ cm	
Active region	$R_{inner} = 6.095$ cm	$\theta_{min} = 24.3$ mrad
	$R_{outer} = 14.455$ cm	$\theta_{max} = 57.7$ mrad
Tungsten sheet thickness	$2.0X_0$	
Silicon crystal thickness	$300\mu m$	
Pad layout	Radial interval = 16 $\times$ 5.225 mm pads	
	ϕ interval = 11.25^0	

Readout: 12,288 channels (6,144 channels on each side of I.P.)
Read out with 768 Amplex chips, each with 16:1 multiplexing.

Performance: Expected resolutions from EGS studies are:

Energy resolution:	$\sigma/E = 23\%/\sqrt{E} = 3.4\%$ at 45.5 GeV
Phi resolution:	$\sigma_\phi = 0.3^0$ (R_{inner})
	$\sigma_\phi = 0.2^0$ (R_{outer})
Radial resolution on fiducial cut:	$12\mu m$