EUROMET PROJECT FINAL REPORT

1.	Ref. No.: 776		2. Subject Field: Photometry and Radiometry			
	(please leave blank)					
3.	Type of collaboration: Cooperation in research					
4A.	Partners: HUT DFM SP			4B.	CEC funded?	
	(institutions)					
5.	Participating countries: FI	DK <u>SE</u>				
6.	Title: High Power Fibre Optic Calibration					
7.	RESULTS:					
In this project HUT, SP and DFM investigated how to do high fibre optic power calibrations. The traceability						
to national standards was also solved for individually for all three laboratories. A comparison measurement						
of fibre optic powers ranging from 1 mW to 200 mW was made at the Helsinki University of Technology in						
October 2003. In this comparison three types of detectors were used as reference meters. HUT and DFM						
utilized spectralon coated integrating spheres, equipped with either an InGaAs (HUT) or Ge (DFM)						
photodiode, SP used a thermopile detector. All detectors had direct connections for fiber connectors (FC/PC).						

Results of the comparison are shown in Figure 1 below. Markings DFM1 and DFM2 refer to the two integrating sphere detectors used by DFM. The most significant sources of uncertainty in the calibrations include the ground noise of EDFA, repeatability caused by interchanging the fiber between detectors, uncertainty of the calibration of the reference detector and the linearity of the reference detector. The measurement uncertainties of the calibrations are 1.5 % for HUT, 2.8 % for SP and 1.3 % for DFM. As can be seen from Figure 1, this comparison showed that these values are realistic.



Figure 1. Results of the comparison of high fiber optic power scales of three Nordic laboratories Oct-03. The values are given as relative deviation from the average.

8. Additional remarks:							
9. Coordinator's name: Anne Andersson							
Address: SP Swedish National Testing and Research Institute, Measurement Technology,							
Box 857, 501 15 BORÅS, Sweden							
Telephone:+46-(0)33-165403 Telefax:+46-(0)33-165620 E-mail:anne.andersson@sp.se							
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