

# SPOTS

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- Acronym:  
Standards Project for Optical Techniques of Strain Measurement
- European consortium for pre-normative research
  - Airbus
  - Ettemeyer AG
  - Honlet Optical Systems GmbH
  - JRC Ispra
  - Measurements Group UK Ltd
  - SNECMA Moteurs
  - Univeristy of Sheffield
- Project Co-ordination:
  - Professor Eann Patterson, University of Sheffield



# RESEARCH FUNDING FROM EU

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- Vth Framework
  - ~ Competitive and Sustainable Growth
- Growth Work Programme
  - 6.2 Methodologies for Measurement and Testing
    - 6.2.1 Methodologies to support standardisation and Community policies

*'RTD activities, co- and pre-normative, related to the objectives of this programme will cover the development, improvement and validation of measurement and testing methods as well as the production of scientific and metrological data needed to define performance, reliability, and safety requirements for industrial products and services.'*



# TIMETABLE

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- Application for prioritisation made to CEN
  - Europe Standards Committee (CEN)
  - Form N324 submitted with support from SPOTS members
- Expression of interest (EOI)
  - Submitted to EU by deadline of 30/4/01
- Dedicated call
  - If EOI is accepted then will be in 5th call
  - Call opens 13/07/01 and closes 17/12/01
  - 6.5 MEuro available for all topics in call
- Start project: June 2002.



# MATRIX OF OPTICAL TECHNIQUES

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	TECHNIQUES	Laser techniques										Grid Techniques				Photoelasticity		Thermo-elasticity	Image Correlation
		Causatics	Speckle Interferometry	Shearography	Holography	ESPI	Moiré Interferometry	In-plane Moiré	Shadow Moiré	Projection Moiré	Coherent Gradient Sensing	Reflection	Transmission						
FIELDS	SUB-TECHNIQUES	A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	K1	L1	M1	N1				
Light sources	Spectral distribution	A2	B2	C2	D2	E2	F2	G2	H2	I2	J2	K2	L2	M2	N2				
	Temporal stability	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	K3	L3	M3	N3				
	Poly/mono-chromatic	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	K4	L4	M4	N4				
	Lasers	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5	K5	L5	M5	N5				
Sensors	Detector type	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6	K6	L6	M6	N6				
	Chip size	A7	B7	C7	D7	E7	F7	G7	H7	I7	J7	K7	L7	M7	N7				
	Pixel shape	A7	B8	C8	D8	E8	F8	G8	H8	I8	J8	K8	L8	M8	N8				
	Pixel response char.	A8	B9	C9	D9	E9	F9	G9	H9	I9	J9	K9	L9	M9	N9				
	Digital/Analogue	A9	B10	C10	D10	E10	F10	G10	H10	I10	J10	K10	L10	M10	N10				
Optical components		A10	B11	C11	D11	E11	F11	G11	H11	I11	J11	K11	L11	M11	N11				
Digitiser cards	Resolution	A11	B12	C12	D12	E12	F12	G12	H12	I12	J12	K12	L12	M12	N12				
	Speed	A12	B13	C13	D13	E13	F13	G13	H13	I13	J13	K13	L13	M13	N13				
	Noise	A13	B14	C14	D14	E14	F14	G14	H14	I14	J14	K14	L14	M14	N14				
	Data Compression	A14	B15	C15	D15	E15	F15	G15	H15	I15	J15	K15	L15	M15	N15				
Physical reference materials	Polarisers & 1/4 waveplates	A15	B16	C16	D16	E16	F16	G16	H16	I16	J16	K16	L16	M16	N16				
	Gratings	A16	B17	C17	D17	E17	F17	G17	H17	I17	J17	K17	L17	M17	N17				
	Coatings	A17	B18	C18	D18	E18	F18	G18	H18	I18	J18	K18	L18	M18	N18				
Calibration materials		A18	B19	C19	D19	E19	F19	G19	H19	I19	J19	K19	L19	M19	N19				
Virtual reference materials	Simulated data	A19	B20	C20	D20	E20	F20	G20	H20	I20	J20	K20	L20	M20	N20				
	Synthesised fringe patterns	A20	B21	C21	D21	E21	F21	G21	H21	I21	J21	K21	L21	M21	N21				
	Synthesis of noise	A22	B22	C22	D22	E22	F22	G22	H22	I22	J22	K22	L22	M22	N22				
Output standards	Image data format	A23	B23	C23	D23	E23	F23	G23	H23	I23	J23	K23	L23	M23	N23				
	Numerical data format	A24	B24	C24	D24	E24	F24	G24	H24	I24	J24	K24	L24	M24	N24				
	Processed data format	A25	B25	C25	D25	E25	F25	G25	H25	I25	J25	K25	L25	M25	N25				
Operational procedures	Specimen preparation	A26	B26	C26	D26	E26	F26	G26	H26	I26	J26	K26	L26	M26	N26				
	Application of surface media	A27	B27	C27	D27	E27	F27	G27	H27	I27	J27	K27	L27	M27	N27				
	Loading: range, rate etc	A28	B28	C28	D28	E28	F28	G28	H28	I28	J28	K28	L28	M28	N28				
	Ambient conditions	A29	B29	C29	D29	E29	F29	G29	H29	I29	J29	K29	L29	M29	N29				
	Specimen alignment	A30	B30	C30	D30	E30	F30	G30	H30	I30	J30	K30	L30	M30	N30				
Correlation methods		A31	B31	C31	D31	E31	F31	G31	H31	I31	J31	K31	L31	M31	N31				



Please quote box number when expressing interest in an area by email to e.a.patterson@sheffield.ac.uk or richard.burguete@baesystems.com

Declarations of interest already received:



Prof. D Goldar  
Prof. M.A. Sutton  
SPOTS Consortium  
Not applicable

Delhi College of Engineering, India  
University of South Carolina  
European Consortium  
pre-normative research not needed



# OBJECTIVES

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- Development of physical reference materials
  - shearography, ESPI, shadow and projection moiré, reflection and transmission photoelasticity, and thermoelasticity
- Design and construction of virtual reference materials
  - including simulated data, synthesised fringe patterns with and without random or systematic noise
- Definition of output standards for image data, numerical data, and processed data
- Identification of routes for traceability to calibrate optical measurement systems.



# SPOTS

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## Standards Project for Optical Techniques of Strain Measurement

### ● Current members

- Airbus
- Ettemeyer AG
- Honlet Optical Systems GmbH
- JRC Ispra
- Measurements Group UK
- SNECMA Moteurs
- University of Sheffield

### ● Some opportunity for one or two new members

- Contact [e.a.patterson@sheffield.ac.uk](mailto:e.a.patterson@sheffield.ac.uk) for further details.

