Photoelastic measurements of differently oriented Lyso samples

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Pubblications:

Optimization of the photoelastic parameters for the stress evaluation in scintillating anisotropic media P.P. Natali, L. Montalto, F. Davì, N. Paone, D. Rinaldi, L. Scalise

Analysis of stress state in the a-c crystallographic plane of $PbWO_4$ crystal L. Montalto, P.P. Natali, F. Davì, P. Mengucci , N. Paone, D. Rinaldi

Theoretical and experimental evaluation of piezo-optic parameters and photoelastic constant in Tetragonal PWO F. Davì, P. Mengucci, L. Montalto, P.P. Natali, A. Ciriaco, N. Paone, D. Rinaldi

Non-invasive inspection of anisotropic crystals: innovative Photoelasticity based methods P.P. Natali, L. Montalto, D. Rinaldi, F. Davì, N. Paone, L. Scalise

Lyso samples characteristics

Same dimensions

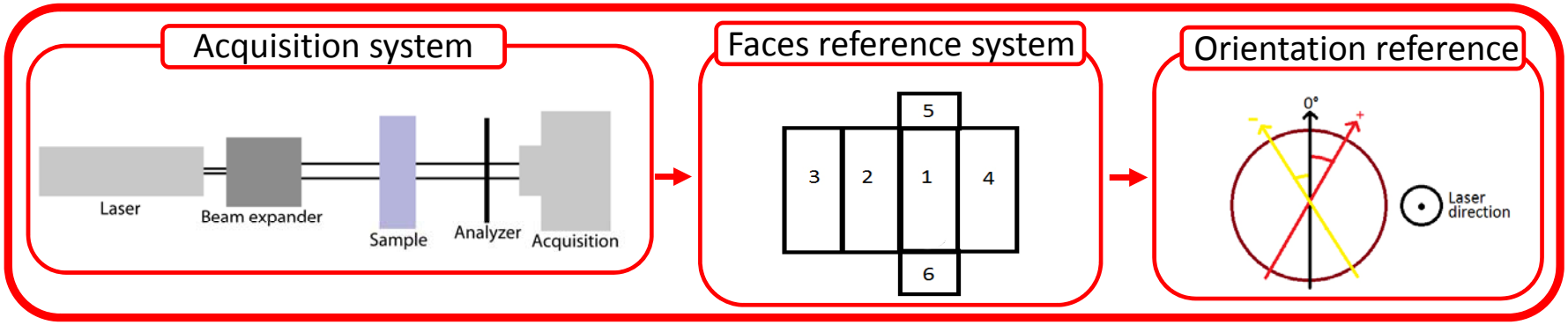
Different lattice orientation

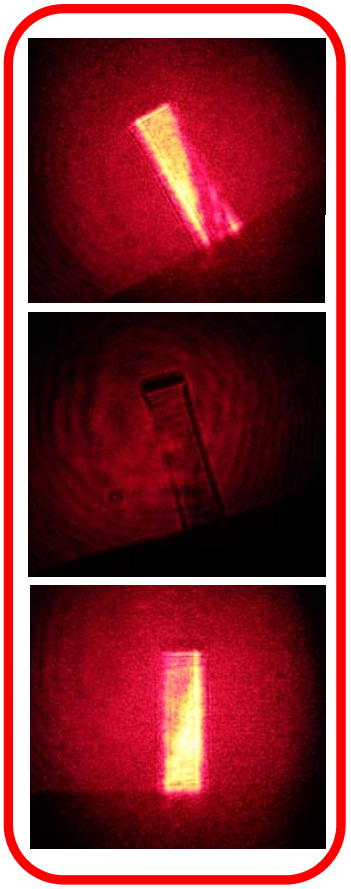
Lattice orientation detection

Timing properties detection

Lattice orientation detection

Calculus of the extinction angles in each face of each sample





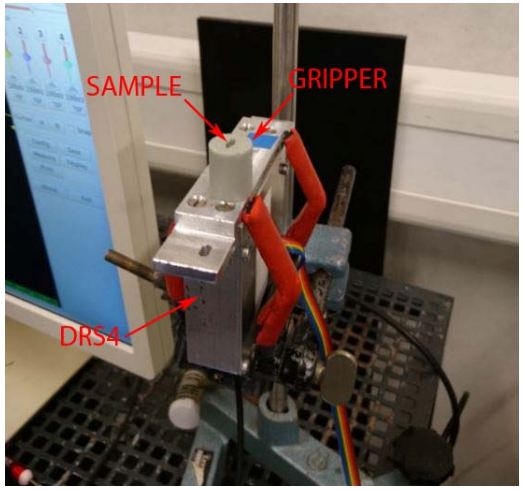
Sample number:

Face number:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	45	-14	29	30,5	-15,5	30,5	-14	-15	28	-13	29	29	30	-14	-13,5	31	-11	31	32	35	-18	31
2	-13	-15	-15	31	31,5	-16	-16,5	28	32	34	-16	-15	36	-16	45	-16	-18,5	-14	32	29	-14	33,5
3	29	31	-11,5	-16	26	-12	28,5	35	-10	30	-13,5	-13	-10,5	45	29,5	-13,5	31	-11	-13	-17	33	-11
4	-16	18	34	-11,5	-15	32	31	-13	-16,5	-17,5	33	34	-16	40	-14,5	32	34	31,5	-16	-10	28	-11
5	-31	45	-31	-31,5	-30,5	-31	45	45	45	-28	-31	-29,5	45	45	-31	-30	-37	-32	45	-36	-29	45
6	45	-30	45	45	-35	45	-29	-30,5	-32	45	45	45	-31	-29,5	45	-38	-31	45	-29	-37	-37	-31,5

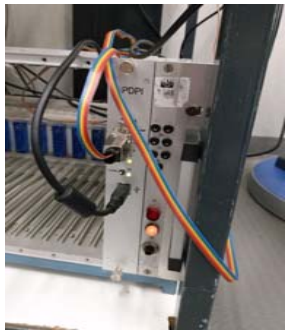
Timing properties detection

Acquisition system layout

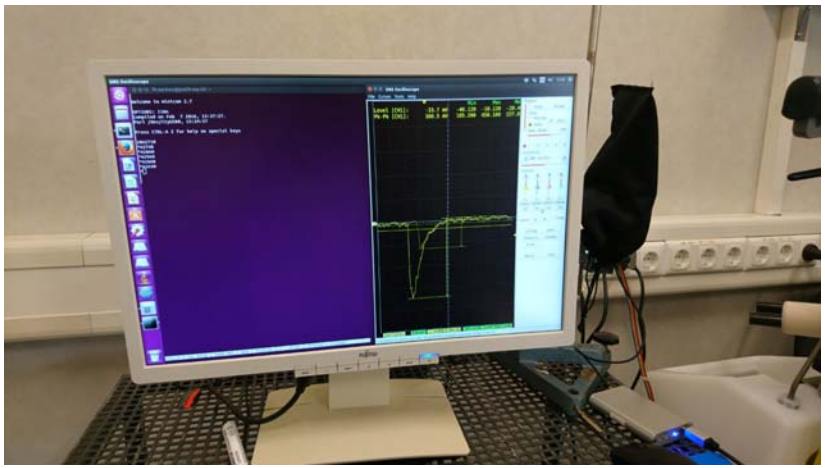


SiPM with gripper

DRS4 Evaluation Board



APDPI board



User interface

Timing properties detection

Type of excitation

Radioactive source

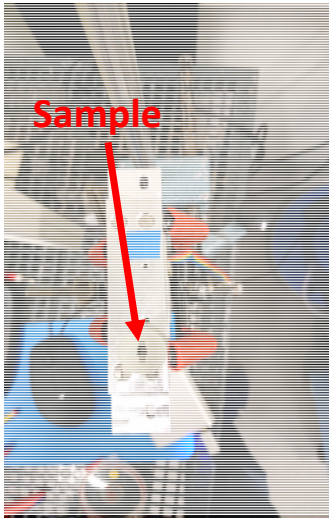
Ultraviolet pulsed laser

Timing properties detection

Radioactive source

Excitation system

Covered system

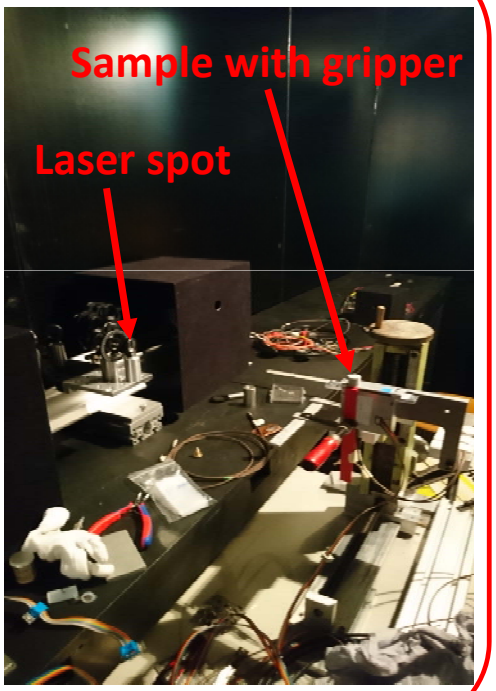


- Natural emission of Lu
- Barium
- Cesium

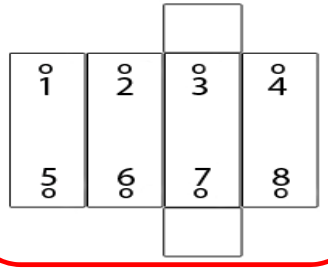
Timing properties detection

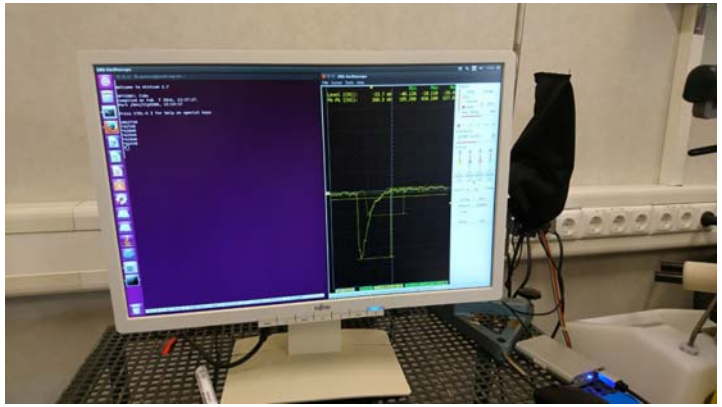
Ultraviolet pulsed laser

Excitation system



Faces reference system



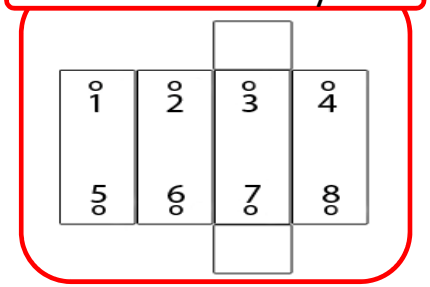


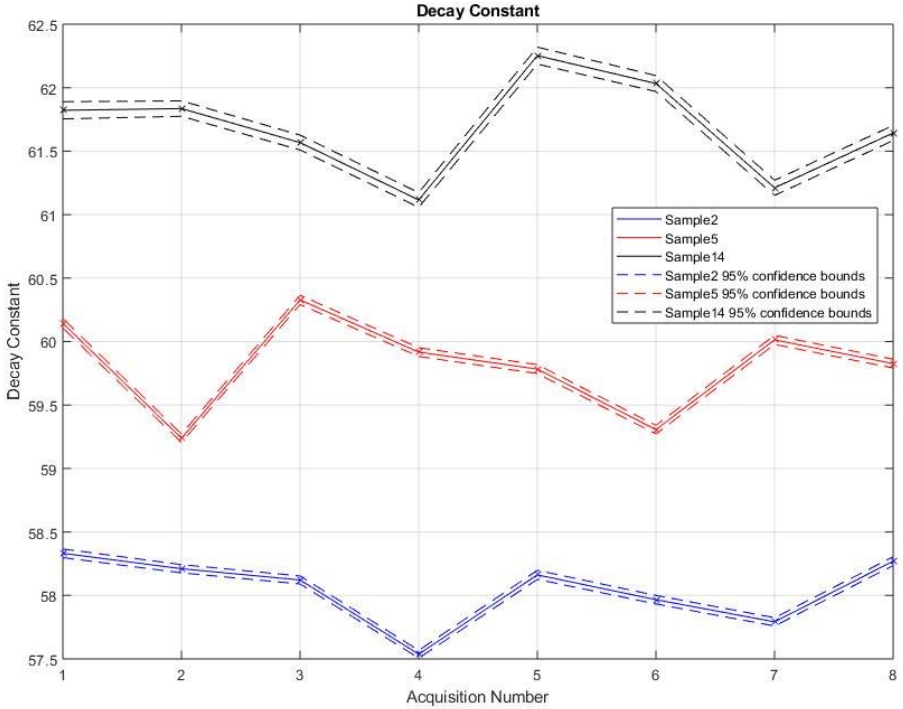
User interface

Timing properties detection

Ultraviolet pulsed laser

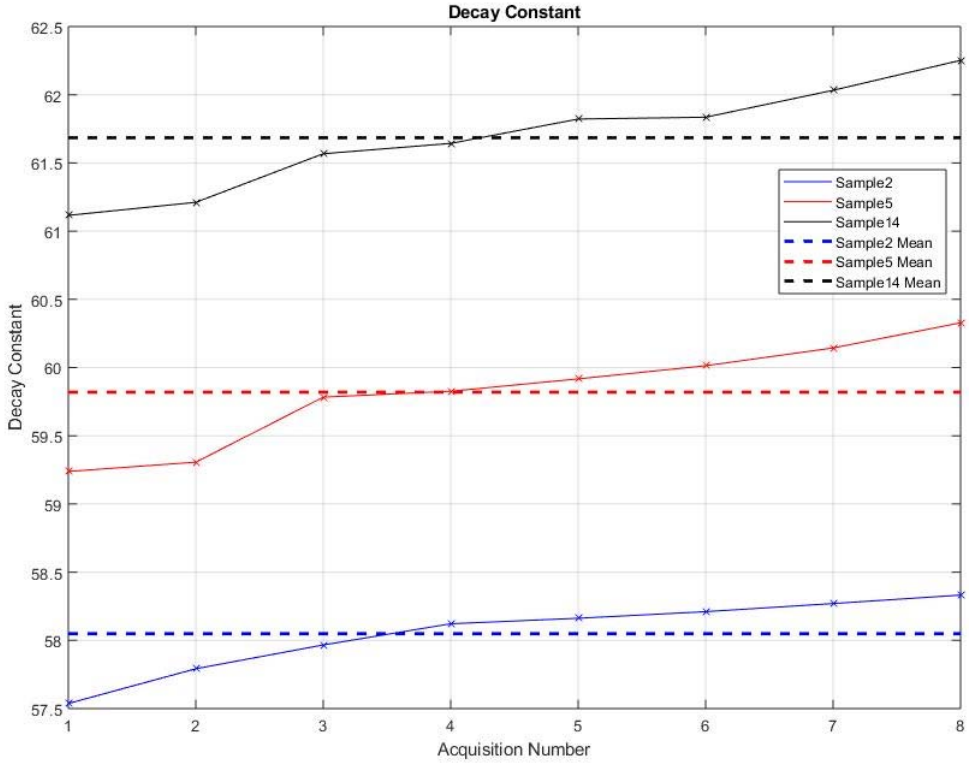
Faces reference system





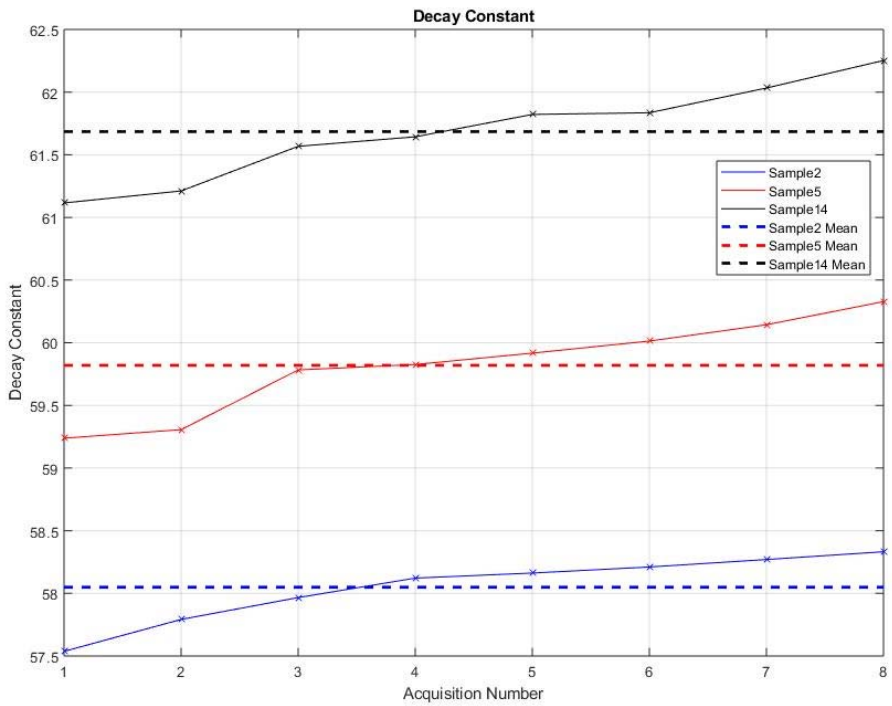
Timing properties detection

Ultraviolet pulsed laser



Timing properties detection

Conclusions



Sample number:

Face number:	2	5	14
1	-14	-15,5	-14
2	-15	31,5	-16
3	31	26	45
4	18	-15	40
5	45	-30,5	45
6	-30	-35	-29,5

Next steps

Deeper knowledge of the lattice orientation and distortion

→ XRD techniques

→ Photoelasticity

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Correlation between lattice orientation and timing properties