EMC Meeting – GSI 11.12.2013

AGENDA

• R. Novotny:	Good and bad news	20 min
• T. Held:	Forward Endcap status	20 min
• Ch. Schmidt:	FW Endcap activities @ Bonn – a status	25 min
• I. Keshelashvili:	Mass production of the Basel LNP	20 min
• P. Semenov:	Status on the new shashlyk prototypes	15 min

the status on crystal production

the request for 250 PWO crystals from SICCAS

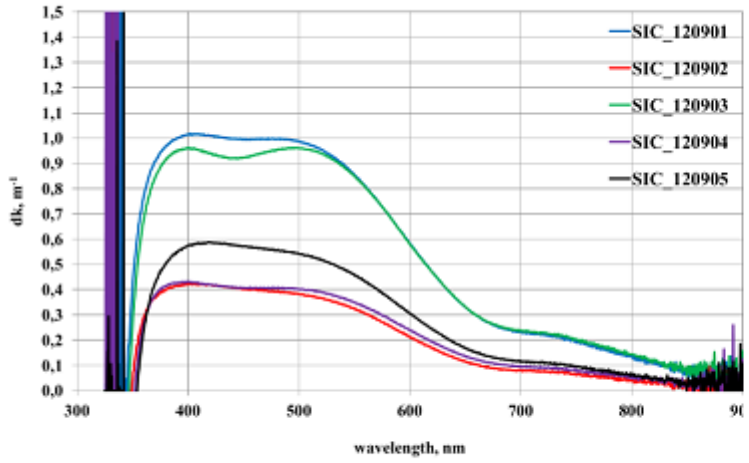
Dear Tord and Rainer,

The radiation hardness of PWO crystals is dose rate dependent according to Ren-yuan's testing results. So it seems regular in some degree with the results of 100 crystals under high dose rate for we have only testing bench of low dose rate irradiation. **We don't think there are quality problems** with our recent production. However, since our crystals can't meet your requirement on radiation hardness at present, it seems **we can't sign** the pre-production contract for we can't promise what we can't make.

Best regards,
Hui YUAN
2013-12-10

Dear Rainer,
Yes, we're very much frustrated by the Marco's contract. During the contract communication with Marco, we informed him that we didn't have the facility to test the radiation hardness, and the result now is we got a lot of loss/rejects, which we cannot bear at the cost we provided. In other words, there're two way that can make us feel comfortable with any contract in the future, either we double the price we're selling or we find out a facility to test the radiation hardness here in China.
So far, it's unfortunate that we don't know what the root cause is that degrade our crystal in the radiation hardness measurement. It could be the raw material and/or the growth process. If your party is able to provide a funding to reveal the root cause, we appreciate very much.
Once we finish the contract with Marco, then we would be able to understand the cost clearly and maybe some causes that influence our yield.
Thank you so much.
Best regards,
Jeff

december 10, 16:30



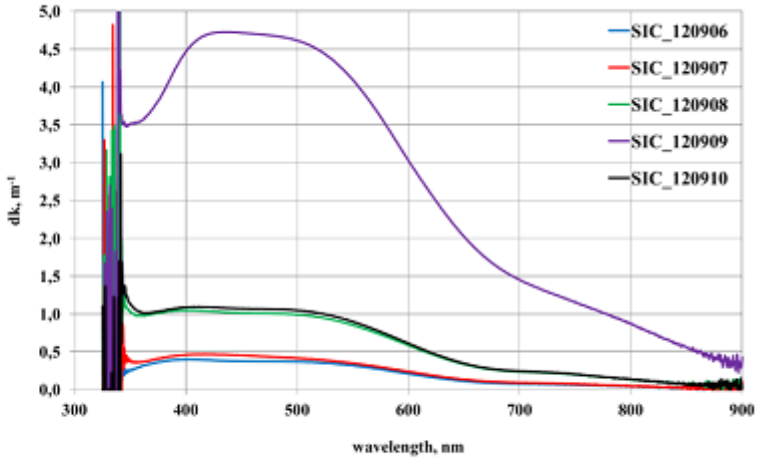


Figure 8: Impact of radiation damage expressed by the change of the optical absorption coefficient k over the entire region of wavelength for two sets of crystals.

PANDA – EMC Internal Report: 2013/1 06.03.2013

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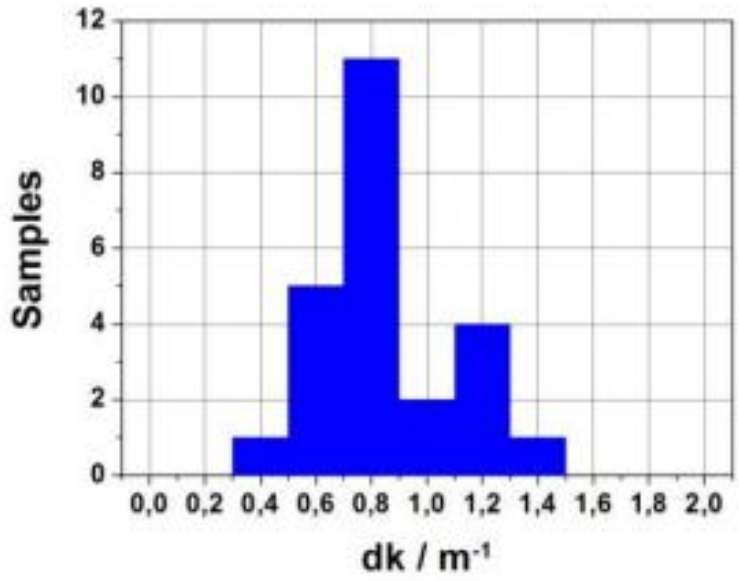
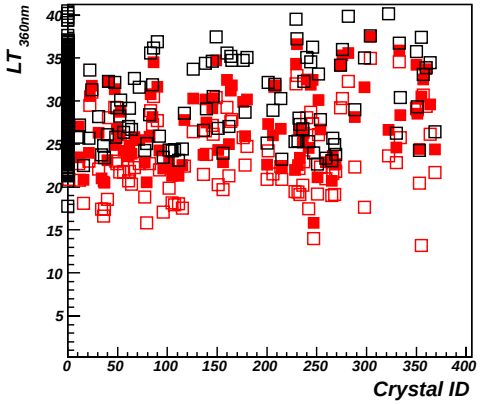
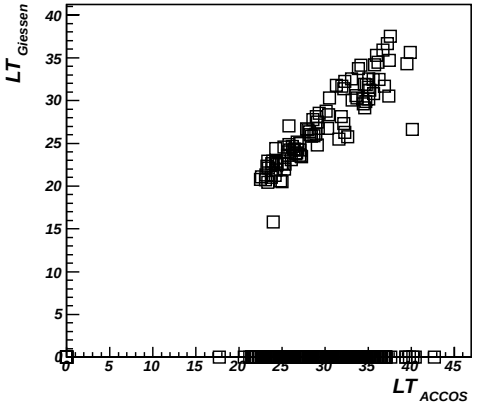
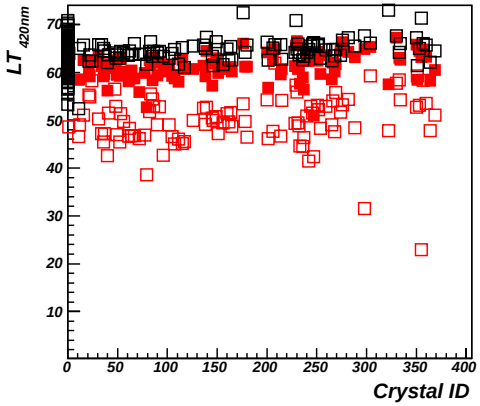
Performance of full size PWO-crystals in PANDA geometry (Type 11) provided by SICCAS

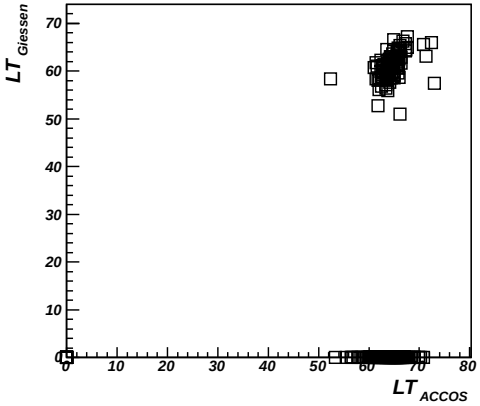
R. Novotny, V. Dormenev
II. Physics Institute, University Giessen

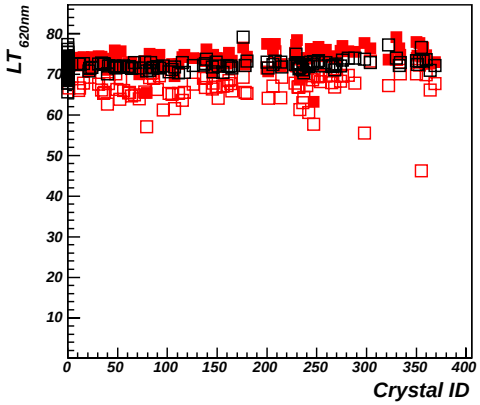


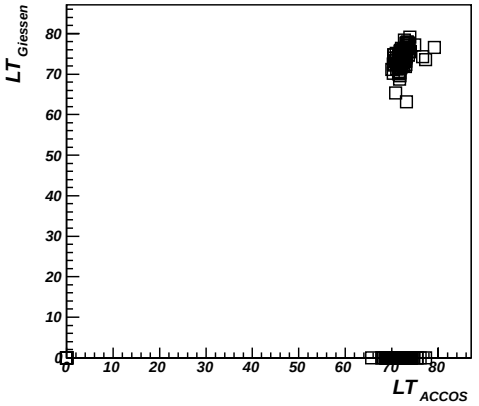






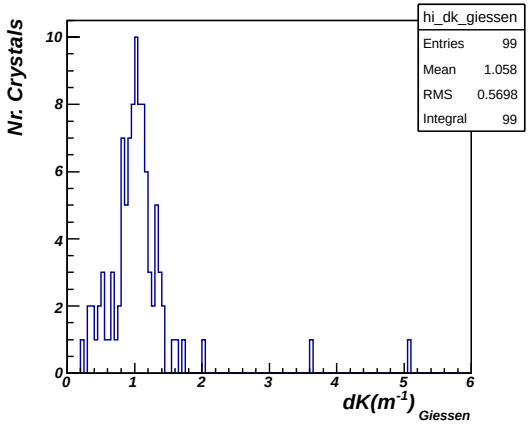


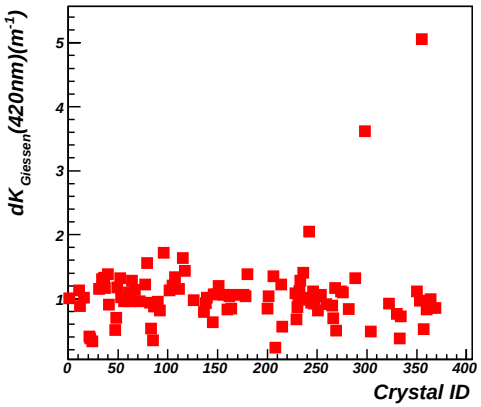


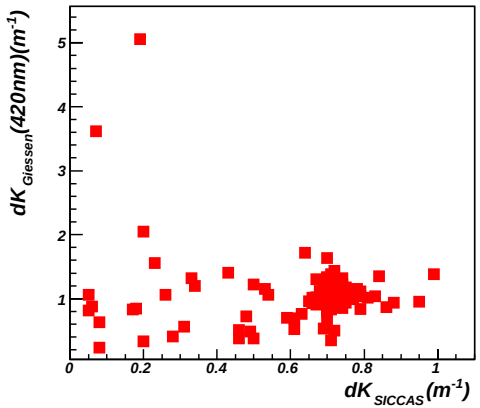


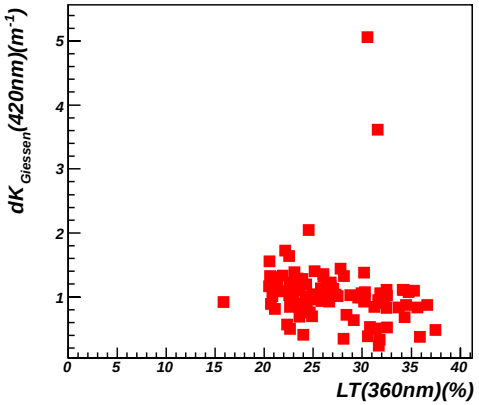
M. Battaglieri:
370 PWO crystals for JLab

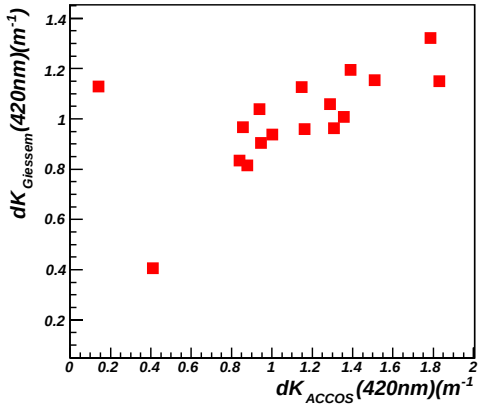
Comparison of the longitudinal transmission measured at ACCOS and at Giessen. The left column shows the longitudinal transmission in % at 360 nm (top), 420 nm (center) and 620 nm (bottom). The black points are the ACCOS results and the black points the Giessen ones. For the Giessen values, full and open squares correspond to the value before and after irradiation, respectively. The right column shows the correlation between the two sets of results. The points with zero $LT_{Giessen}$ correspond to the crystals that have not yet been characterized.











M. Battaglieri:
370 PWO crystals for JLab

Results of the irradiation tests performed at Giessen on the batch of 100 crystals. The top plot shows the distribution of the induced absorption coefficient at 420 nm. The center-left and center-right plots shows the measured values of dK(420nm) as a function of the crystal ID and of the values reported by the manufacturer, respectively. The bottom-left plot shows the correlation between dK(420nm) and the longitudinal transmission at 360 nm. The bottom-right plot shows the correlation between the induced absorption values measured at Giessen and at ACCOS.

M. Battaglieri et al., Genova

4. Conclusions

Based on the results of the visual inspection of crystals upon their delivery at CERN and the ACCOS measurements of light yield and optical properties, we conclude that:
13 crystals are to be replaced because heavily damaged,
12 crystals are to be replaced because broken,
43 crystals are to be replaced because outside the specifications.
Considering the overlaps between these three categories, the total number of crystals to be replaced is of 66. A set of 64 crystals was sent back to SICCAS for replacement in October 2013. Two of the crystals that failed the specifications, #11 and #151, were not returned since they were part of the batch subjected to irradiation tests and further checks were performed at Giessen in November 2013.

Based on the results of the irradiation tests, a large fraction of the crystals fails the requirements imposed on the induced absorption, $dK<1\ m^{-1}$. According to the Giessen results, this fraction is of the order of 50%. Releasing the requirement to be $dk< 1.3\ m^{-1}$, the number of crystals that fail this constraint is of 16 over the 100 subject to test. Extrapolating these results to the full crystal batch, we should expect to have about 60 crystals failing the reduced requirements. These crystals will have to be replaced. To identify them, the crystals that were not yet measured at Giessen, together with the 64 new crystals SICCAS will sent in replacement of the ones already rejected, will be subjected to the same tests at Giessen in the near future.

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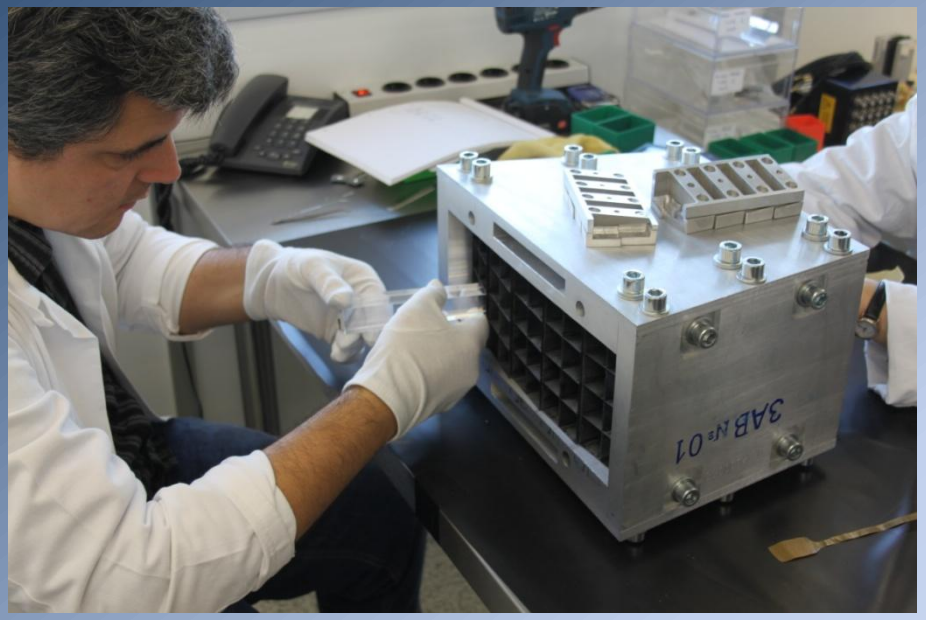
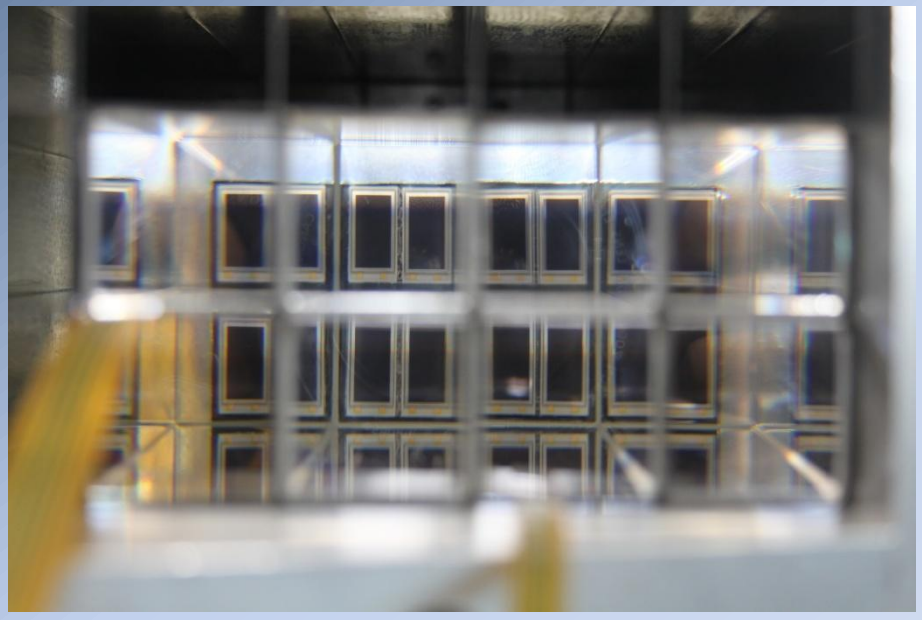
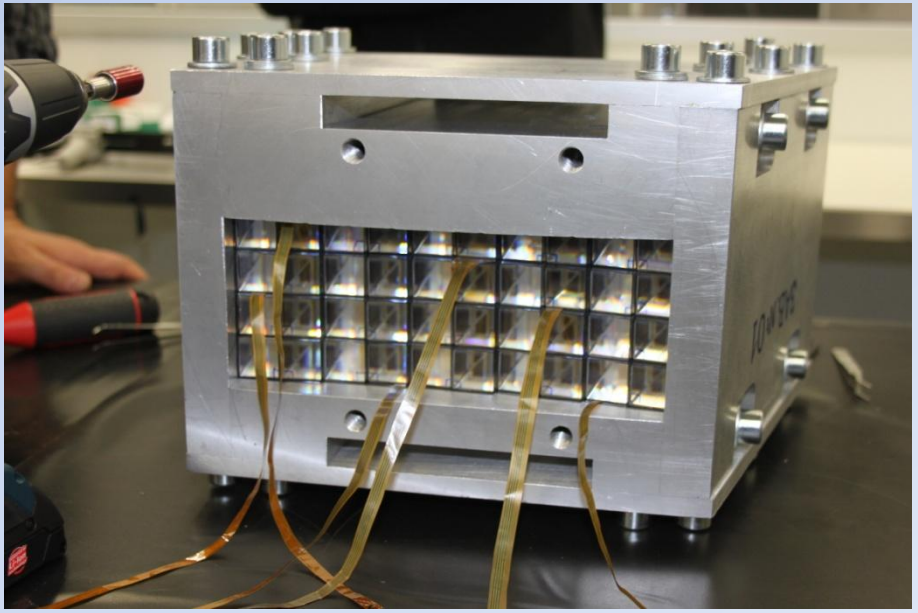
proposed R&D project

status on PROTO120







mechanical parts meet requirements

electronics: **missing cables**
no proper functioning