Digital Positron Annihilation Lifetime Measurement System

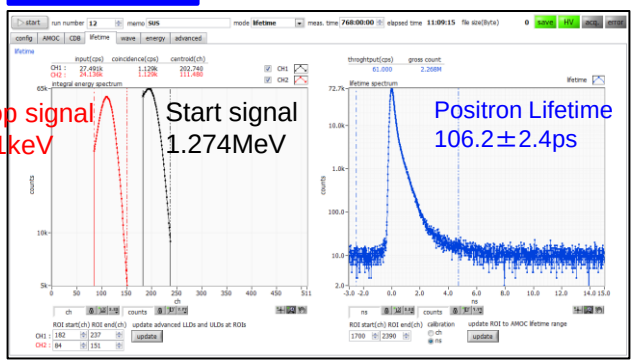
TechnoAP

DPALMS-LCA

This is a device which integrates measuring equipment and power supply equipment necessary for positron annihilation method which can analyze molecular level nanoscale space structure. In **lifetime measurement**, high-speed pulse signals from two BaF_2 scintillators are captured by 3G sps board to calculate lifetime. In **CDB measurement**, coincidence is taken from two HPGe semiconductor detectors, and a two-dimensional histogram is generated from the crest value. Furthermore, **AMOC measurement** that correlate the lifetime and momentum are also realized by combining these modules.

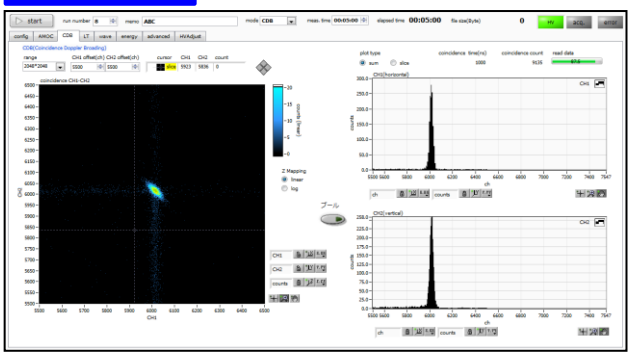
Function	- LIFETIME meas. - Single spectrum meas., Doppler spread meas. - AMOC meas.
ADC	2 channel 3G sps 8-bit for LIFETIME 2 channel 100M sps 14bit for CDB/AMOC
Time resolution	FWHM < 180 ps *Depends on the detector
Energy resolution	1.69 keV (1.33 MeV @ ^{60}Co)
Lifetime range	< 1100 ns (8192 ch.) Long Lifetime meas. support
LIFETIME	Positron Lifetime: 106.2 ±2.4 ps, Standard stainless steel o-Ps Lifetime: 1.62 ±0.05 ns, Standard quartz glass (Silica)
High Voltage Power Supply	2CH: +5000 V / CH for Ge semiconductor detectors 2CH: -4000 V / CH for photomultiplier tubes
Communication I/F	Ethernet (TCP/IP)
Dimensions / Weight	170(W) x 320(H) x 400(D) mm / 8430g
Software	Data acquisition and device control application software

Lifetime

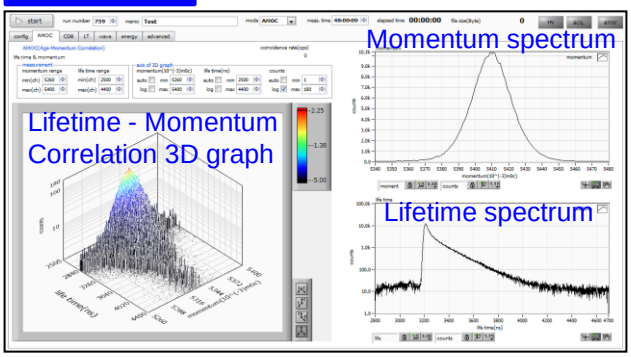


Radiation source: ^{22}Na, Sample: Polycarbonate

CDB



AMOC



Sample：Silica

System installation image

*Images is for illustration purpose.
*Please note that contents may change without prior notice.

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