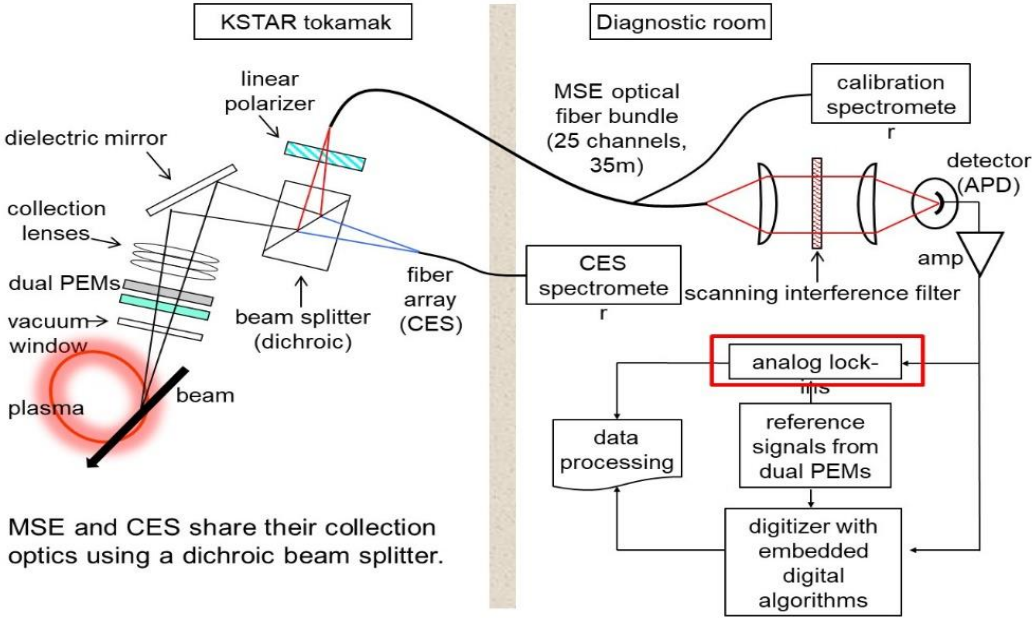
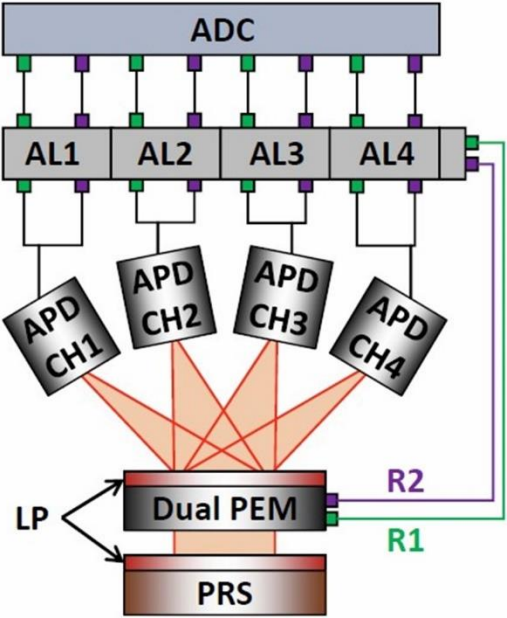


Multi-channel analog lock-in system for real time motional stark effect measurements

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 National Fusion Research Institute, Daejeon, Korea



KSTAR MSE Analog lock-in system diagram



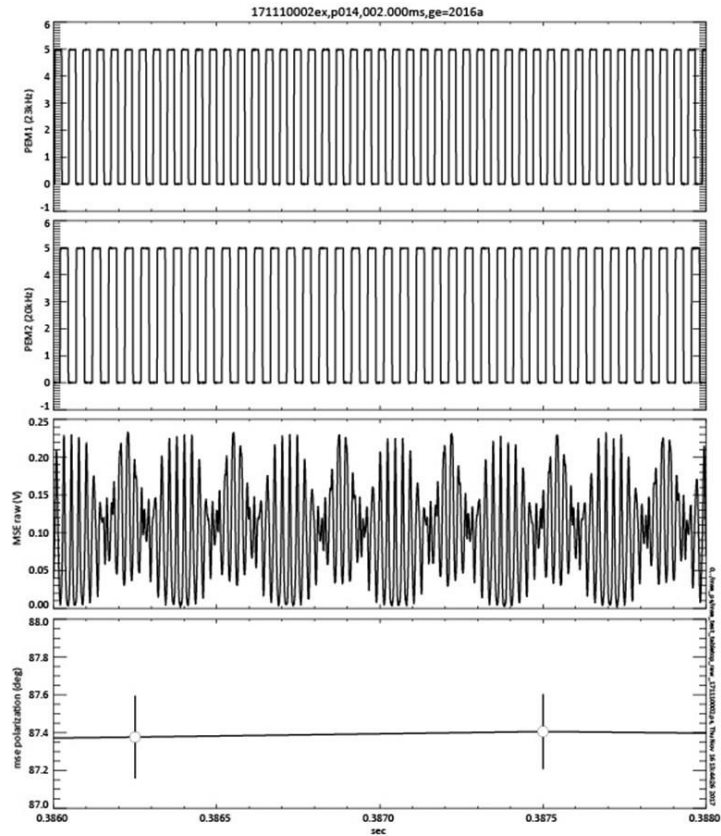
Experimental setup Multi-channel analog lock-in amplifier



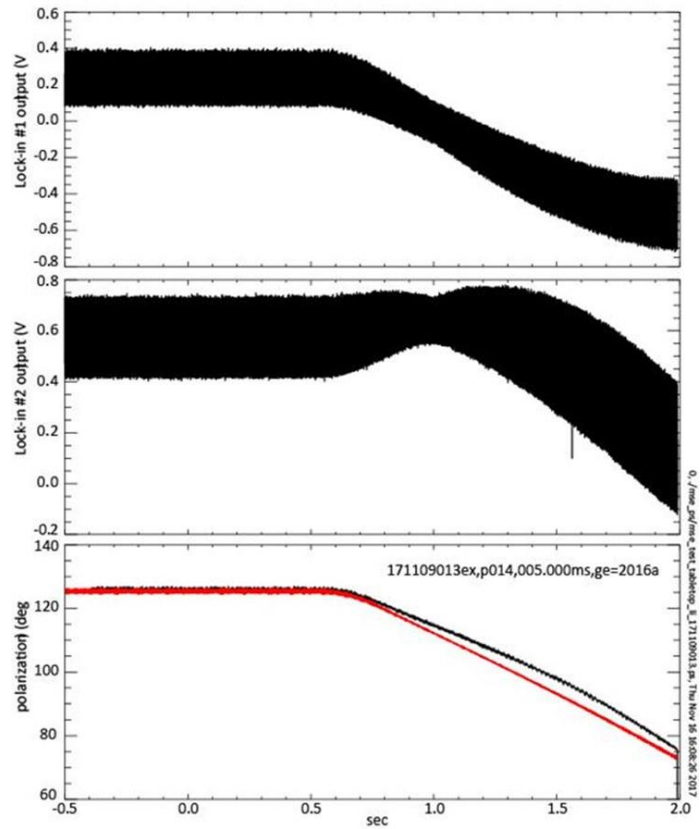
Experimental setup with linear polarizer mounted on the rotation stage with 4-channel APD modules

Single-channel analog lock-in Test

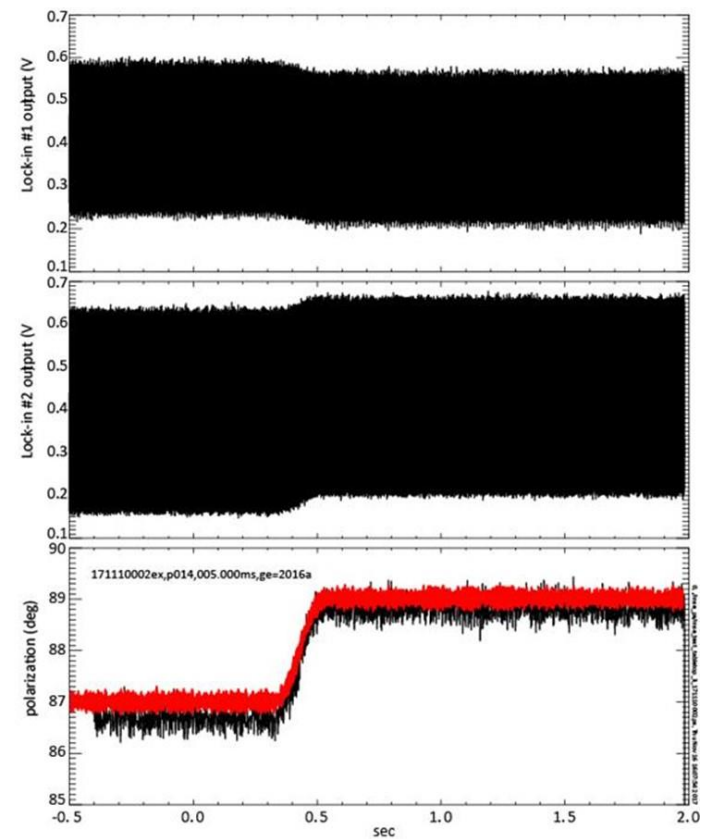
Raw ref and signal



Large input variation (50°)



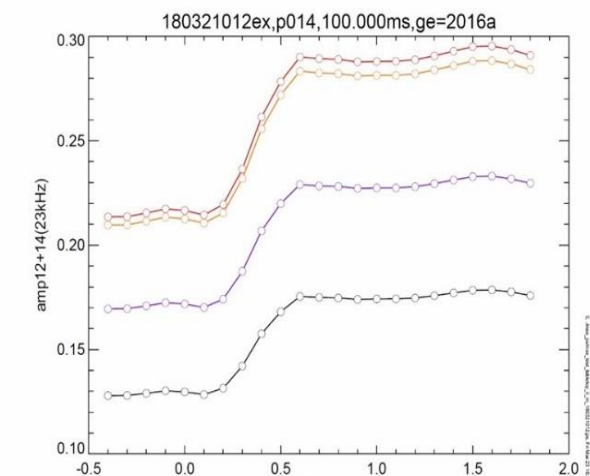
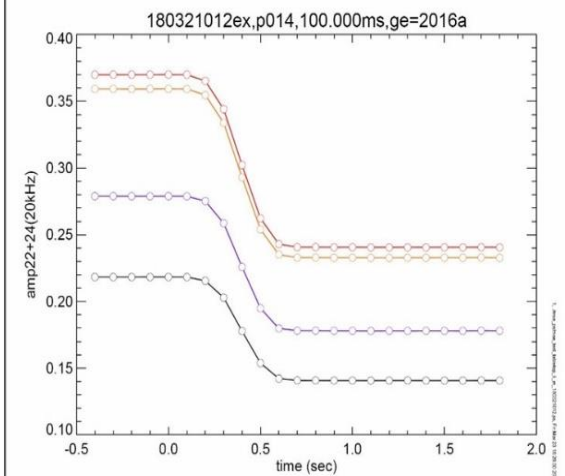
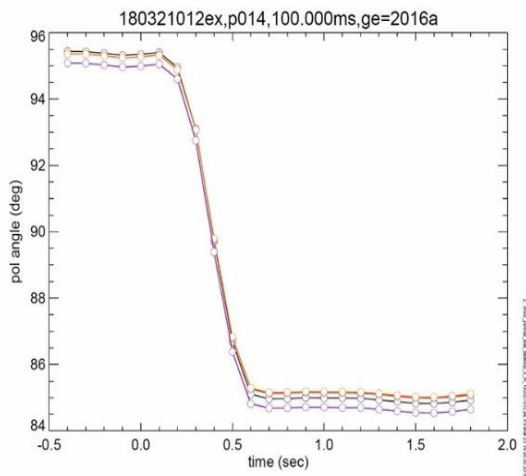
Small input variation (2°)



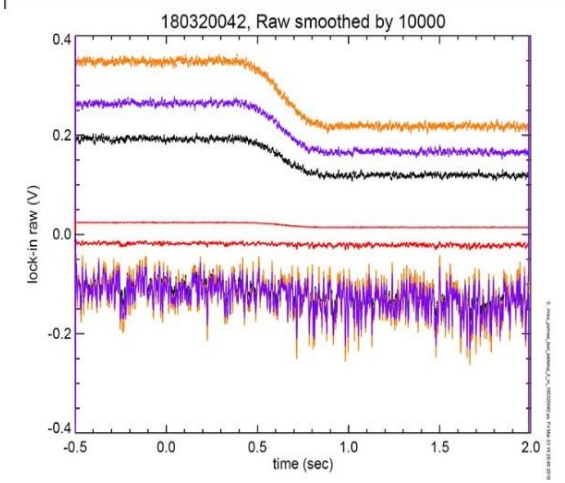
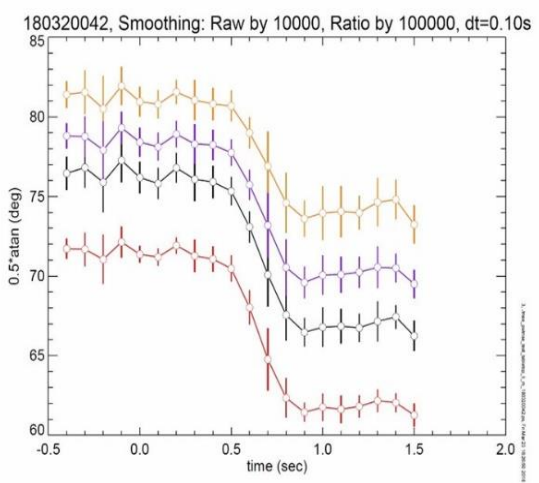
Comparison of the analog lock-in (black) with numerical FFT (red) results

Multi-channel analog lock-in Test

Numerical
FFT



Analog
lock-in test



- Multi-channel analog lock-in results have the same sensitivity as input polarization change.
- One of the ref components are relatively weakly responding (due to the fluctuation of the reference signals).