



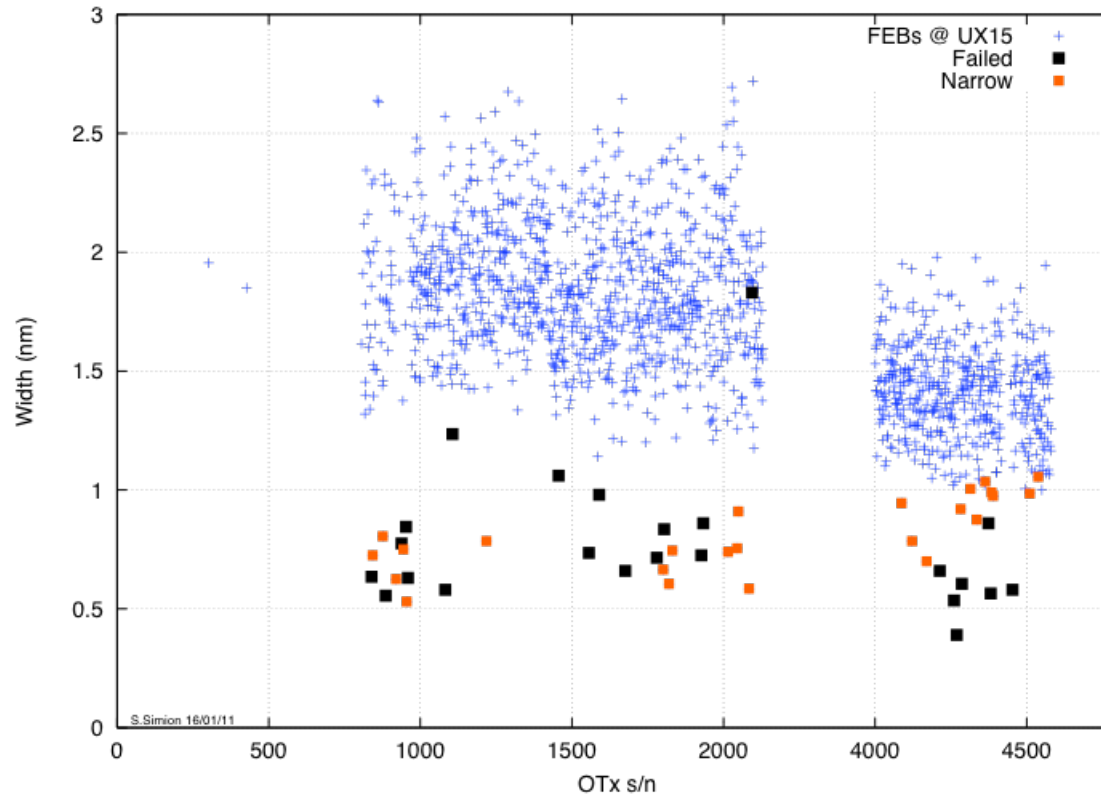
Comparison of Optical Spectrum Width of VCSELs on Opto-boards vs Low-Humidity Test at OSU

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January 13, 2012



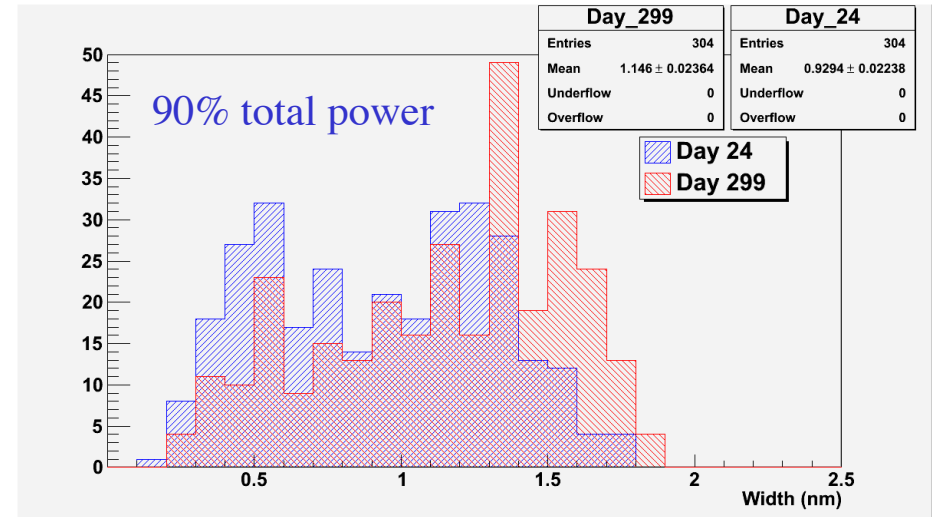
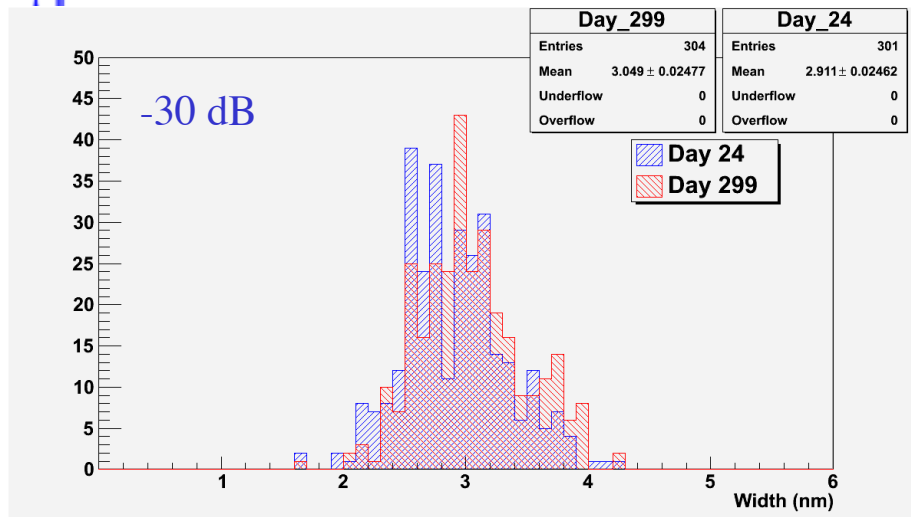
Spectrum Width of LAr VCSELs



- All but one failed VCSELs have narrow width
- All VCSELs with narrow width removed in 2011 shutdown
⇒ no observed failure since



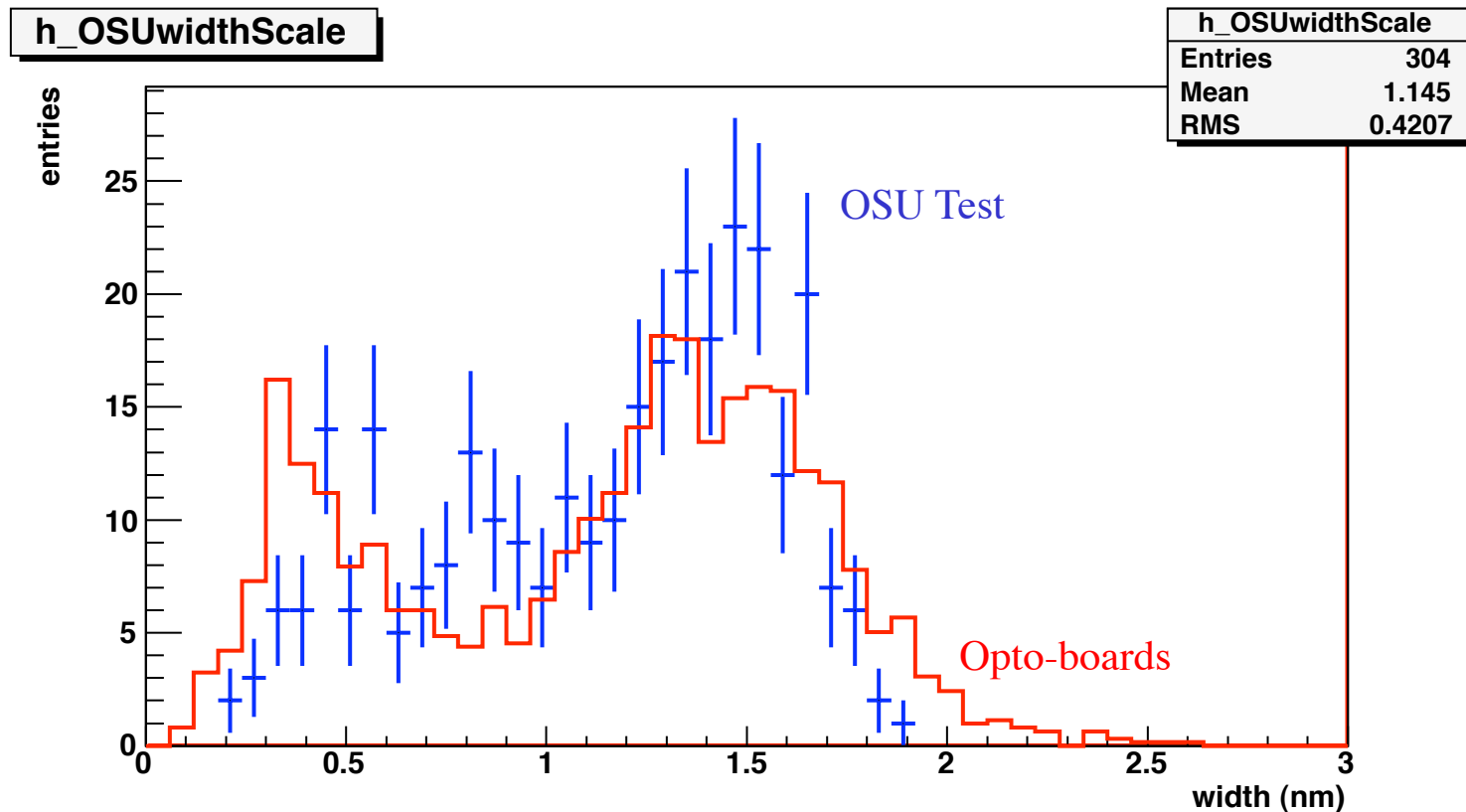
Spectrum Width of VCSELs at OSU Test



- VCSELs in low-humidity test are from original opto-board production
- Spectrum width defined as -30 dB of peak power has single peak
- Spectrum width defined to cover 90% of total power has two peaks?



Width Comparison of Opto-Board vs OSU Test VCSELs



- some similarity between two samples in the width spectrum
- no VCSEL failure at OSU test in past 13 months
- ⇒ VCSELs with narrow width are not dying any faster