Initial comments on LSM Tech objective inverter.

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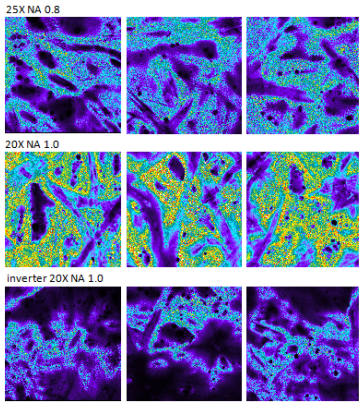
How much light is lost using the inverter?

The following test was done using the high tech standard fluorescent sample of yellow lab tape mounted under a 1.5 coverglass in water. With the exception of the DeepSee, all settings were kept constant. Imaging was done all under water immersion (with the 25X objective's ring set accordingly). The graphs shown are for excitation at 910 and emission at 520-555. The results were essentially the same at all emission filter settings.

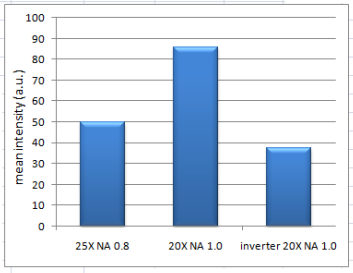
Summary: The 20X N.A. 1.00 objective is almost 2X more efficient than the 25X N.A. 0.80 currently in use. The objective inverter halves the intensity. Therefore, the new 20X with the inverter is approximately the same as the old 25X without the inverter. (However, this is only throughput and the resolution was not tested.)

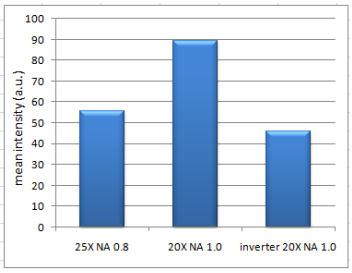


	bg 12	bg 20
25X NA 0.8	47.90	54.28
	48.75	54.09
	52.90	58.09
20X NA 1.0	88.65	91.77
	82.00	86.46
	86.61	90.01
20X NA 1.0	37.51	45.31
inverter	35.88	44.64
	40.48	49.69
	36.17	43.23

bg 12		
25X NA 0.8	20X NA 1.0	inverter 20X NA 1.0
49.85	85.75	37.51

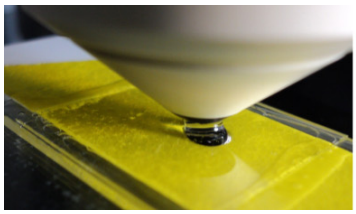
bg 20		
25X NA 0.8	20X NA 1.0	inverter 20X NA 1.0
55.49	89.41	45.72





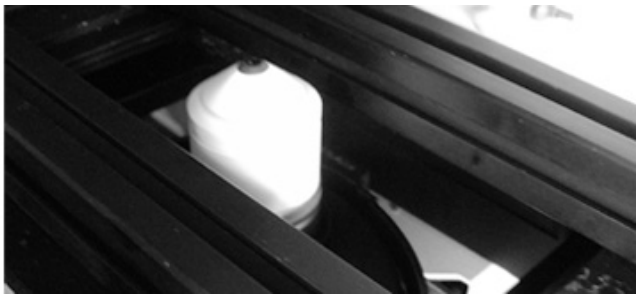
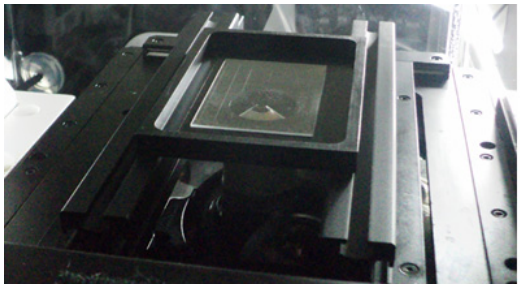
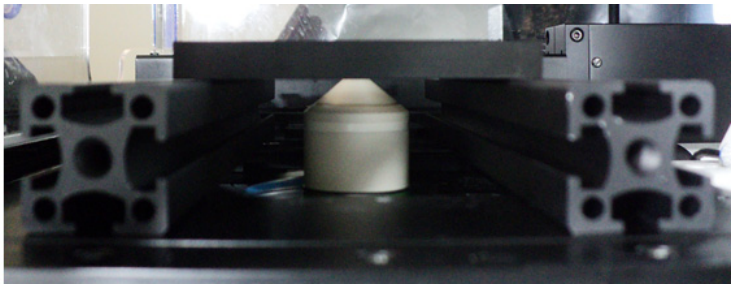
excitation 910 nm
emission 520-555

The 20X objective has very long working distance which is great. The sample is in focus at the objective position as pictured.

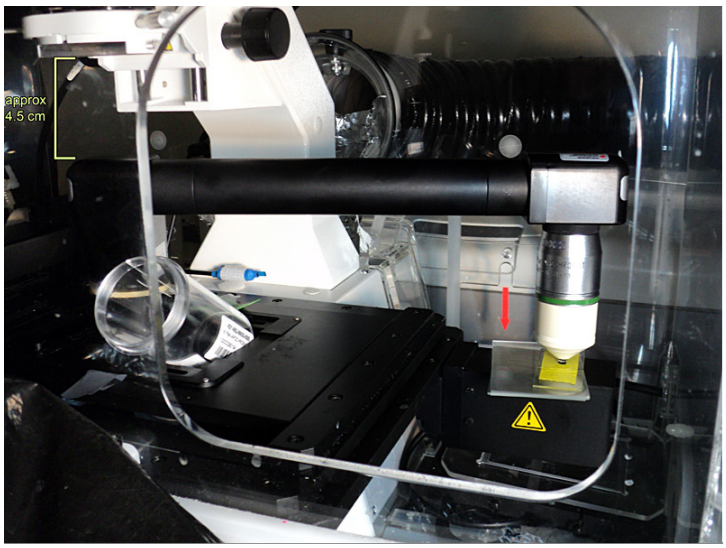


Microscope configurations:

The 20X objective is longer than all the other lenses and rises above the stage. Therefore, we laid rails on the stage to prop up the sample.

LSM Tech Inverter:



The current version installed on our microscope has a long arm meant to position the objective off to the side of the stage. Perhaps a better configuration for us would be a tube to lift the objective higher and a shorter arm to position the objective over the current stage. We need to make better measurements, but essentially the following picture.