Interferometer Layout for Both IR and Green Beams, With and Without ITMs

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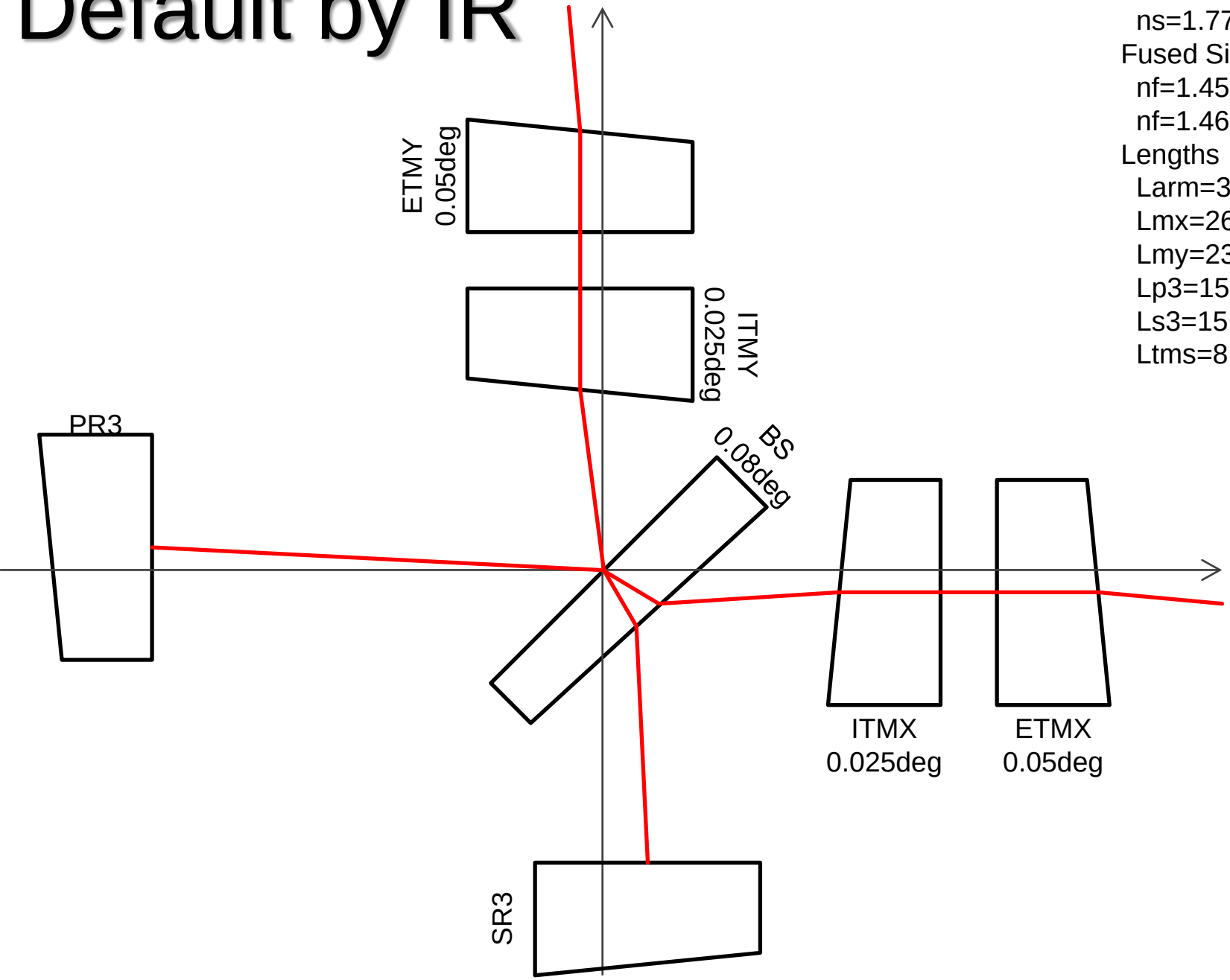
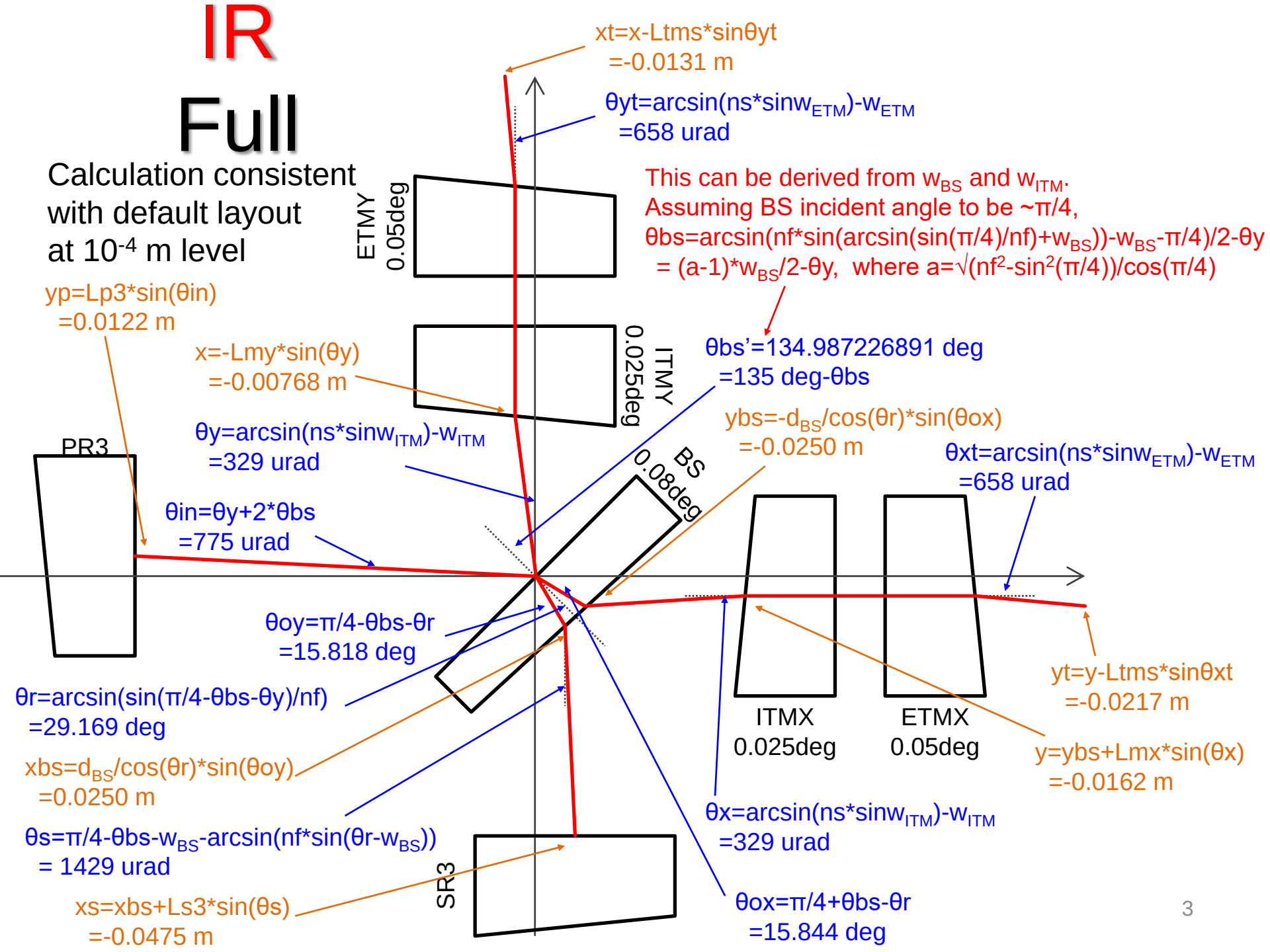
Default by IR



Sapphire
ns=1.754 for 1064 nm
ns=1.772 for 532 nm
Fused Silica
nf=1.450 for 1064 nm
nf=1.461 for 532 nm
Lengths
Larm=3000 m
Lmx=26.6649 m
Lmy=23.3351 m
Lp3=15.7386 m
Ls3=15.7386 m
Ltms=8.3 m

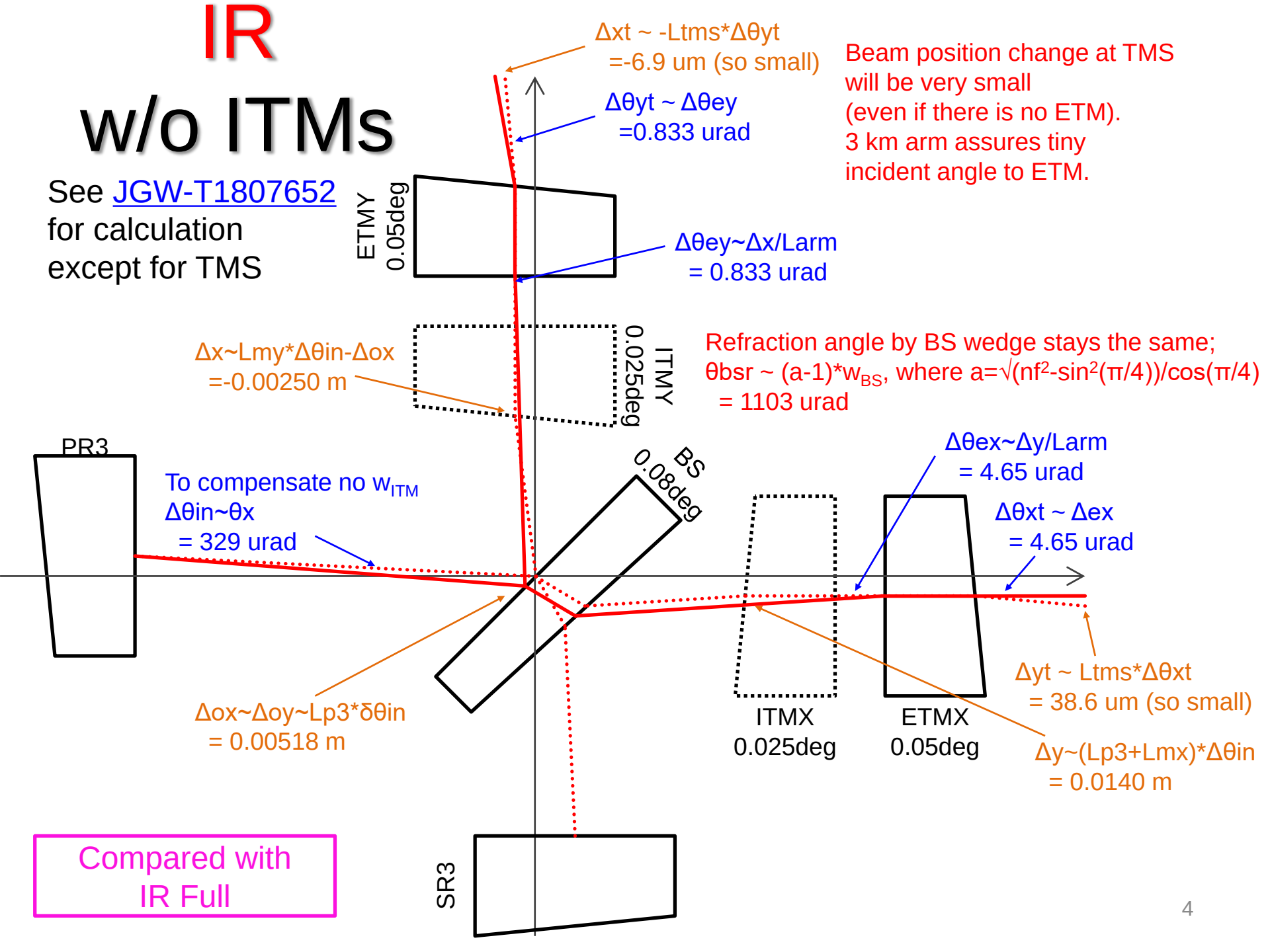
IR Full

Calculation consistent with default layout at 10^{-4} m level



IR w/o ITMs

See JGW-T1807652 for calculation except for TMS

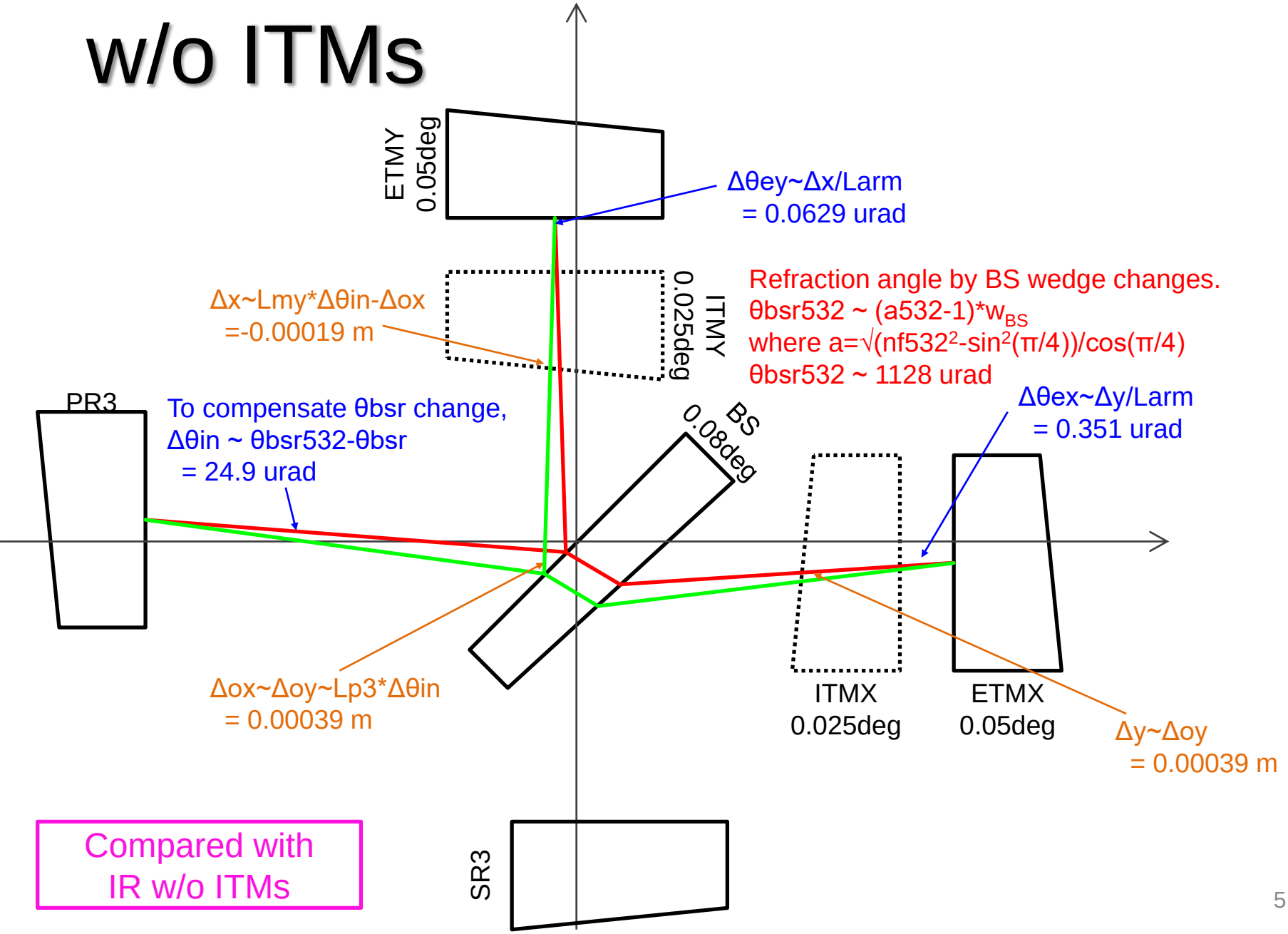


Beam position change at TMS will be very small (even if there is no ETM). 3 km arm assures tiny incident angle to ETM.

Refraction angle by BS wedge stays the same;
$\theta bsr \sim (a-1)*w_{BS}$, where $a=\sqrt{(nf^2-\sin^2(\pi/4))}/\cos(\pi/4)$
= 1103 urad

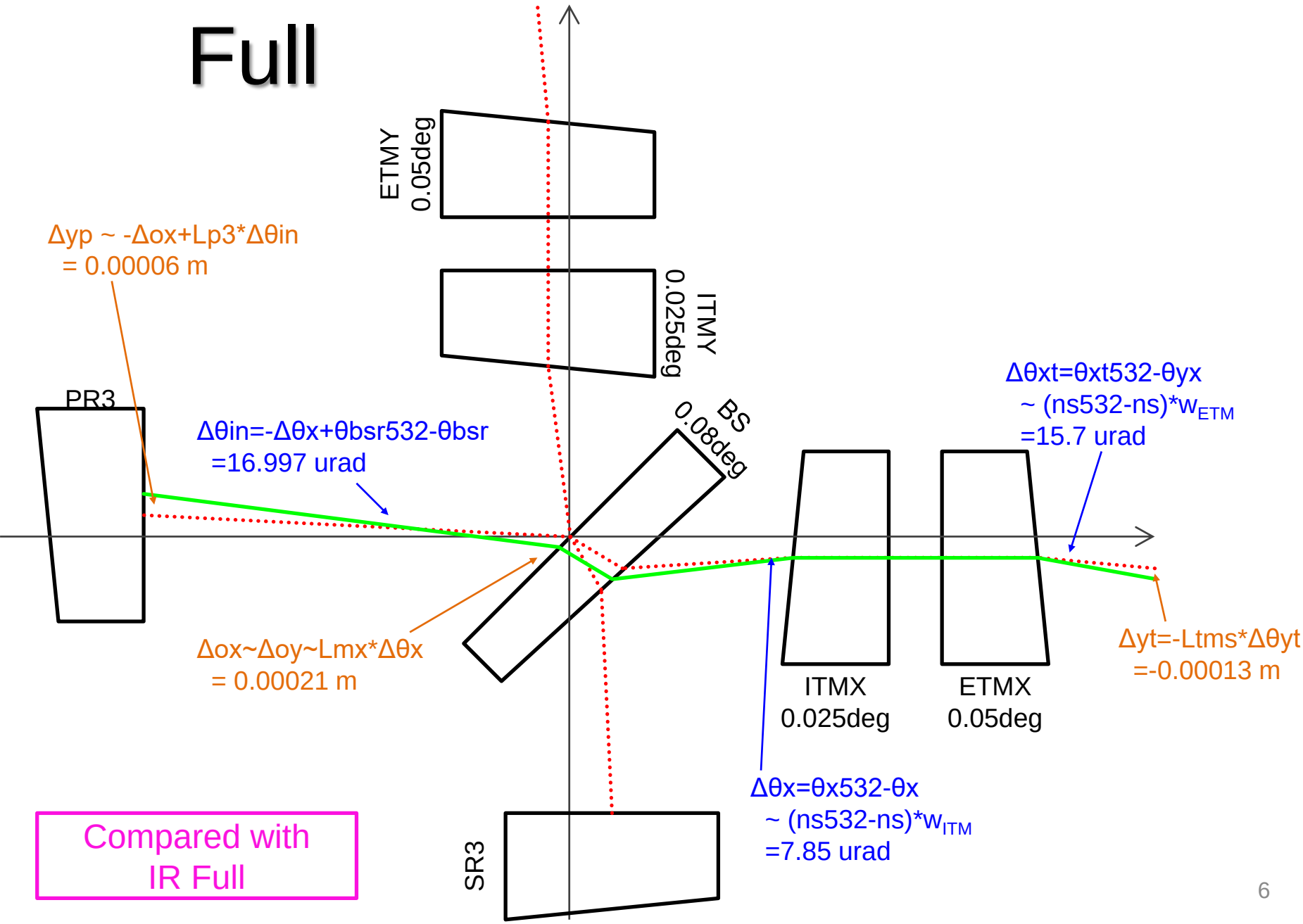
Compared with IR Full

Green
w/o ITMs



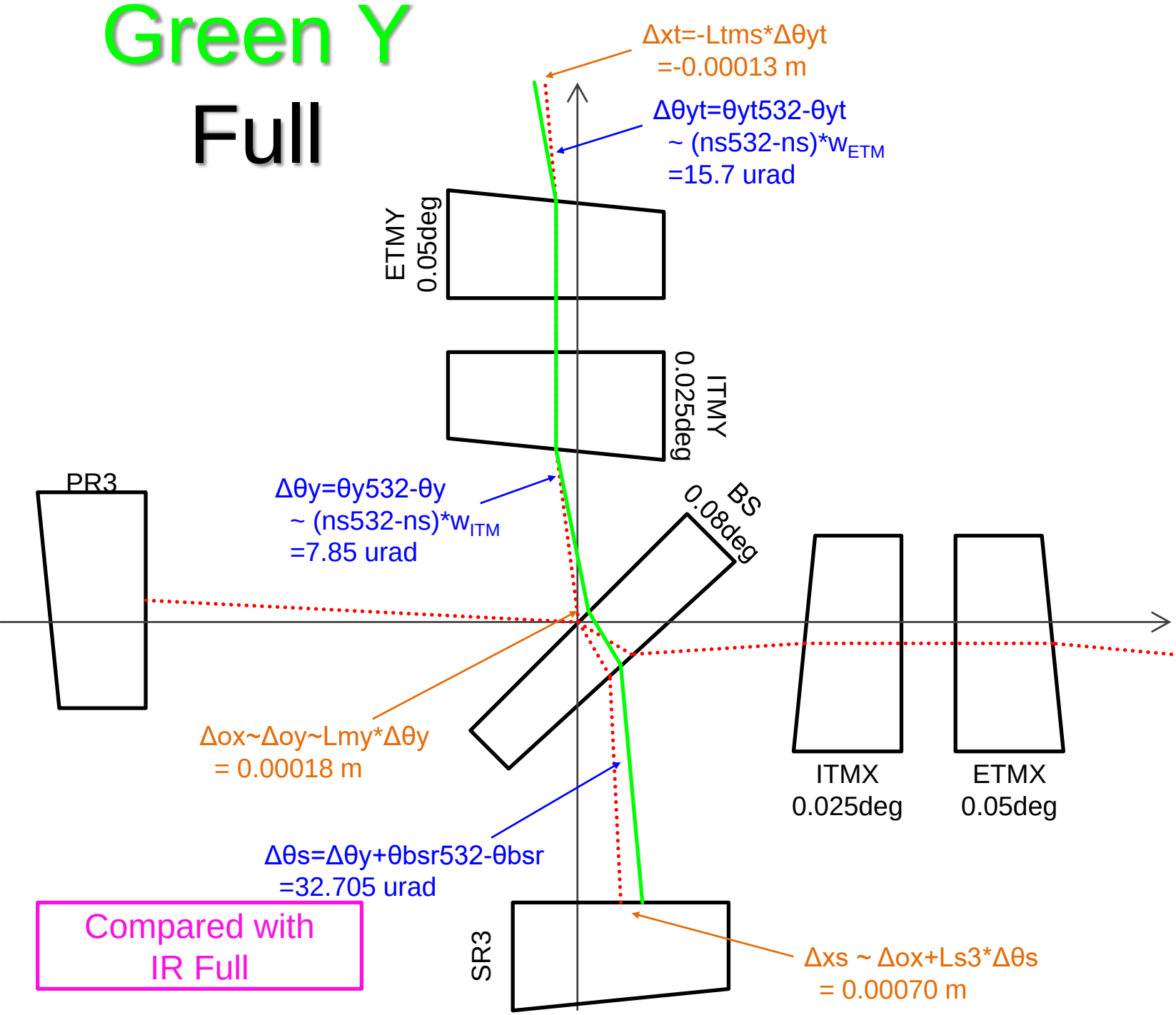
Compared with
IR w/o ITMs

Green X Full



Compared with IR Full

Green Y Full



Compared with
IR Full