updates on the bright time sky model

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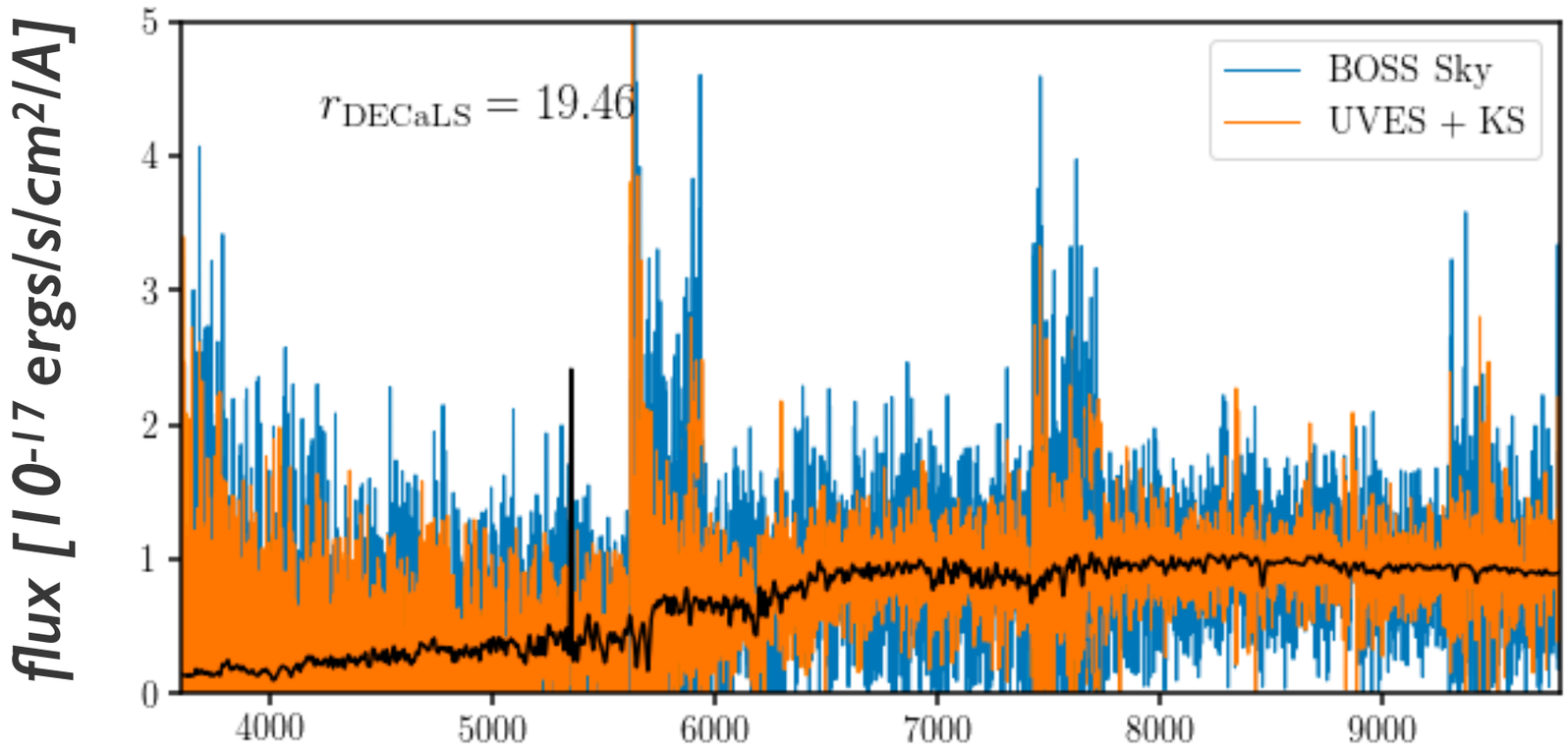
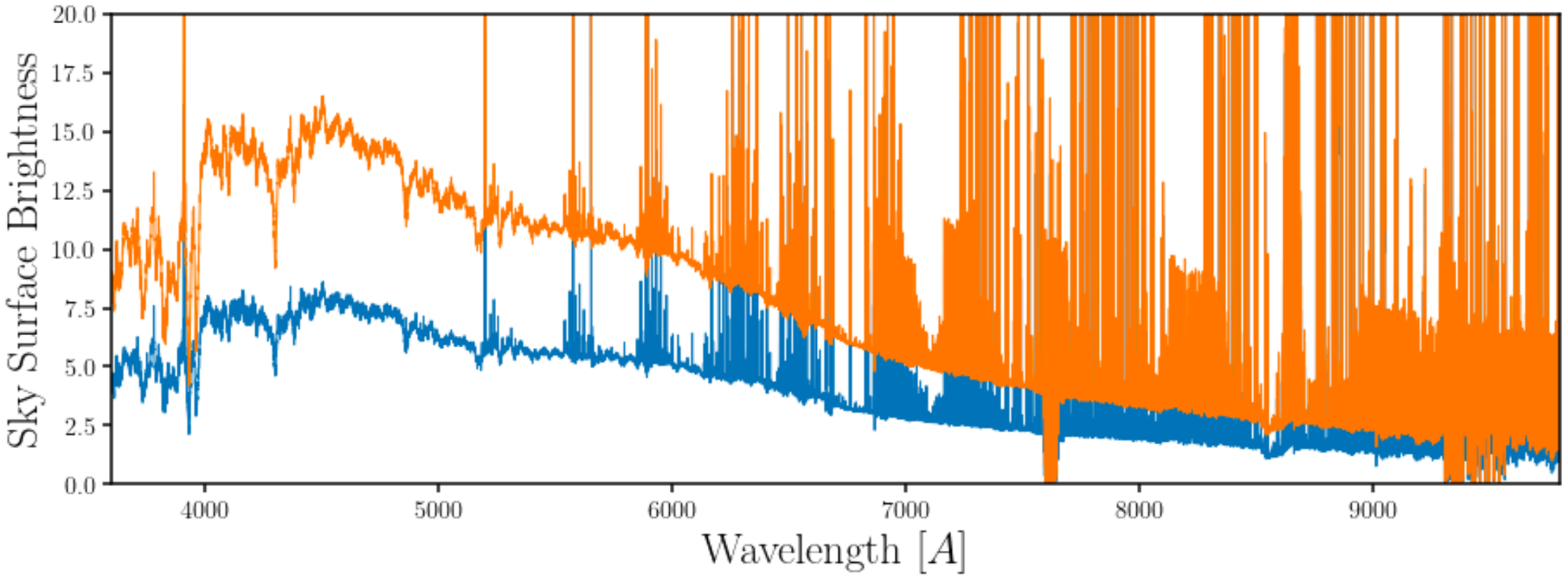
the original sky model (UVES dark sky + Krisciunas & Schaefer 1991)
underestimates *the sky brightness*



BGS galaxy spectrum w/ original sky model

BGS galaxy spectrum w/ sky flux from BOSS fiber

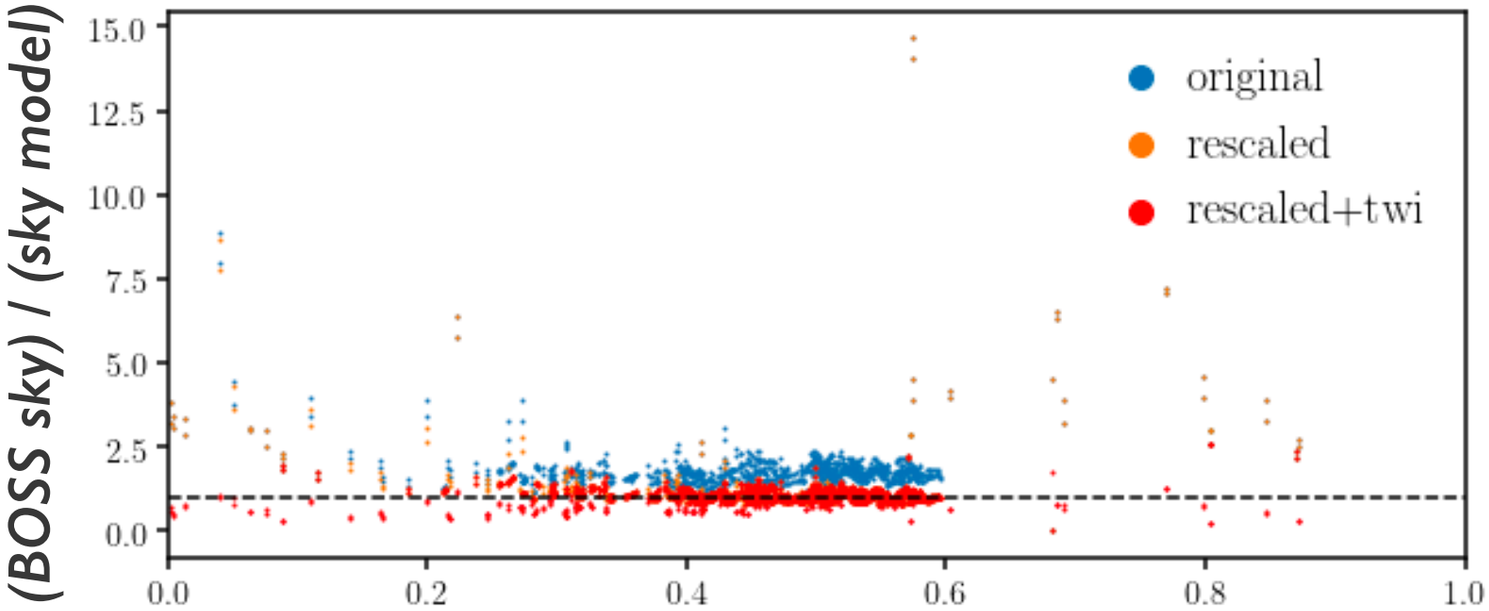
new sky model = *(UVES dark sky) + (re-fit Krisciunas & Schaefer 1991) + (twilight)*

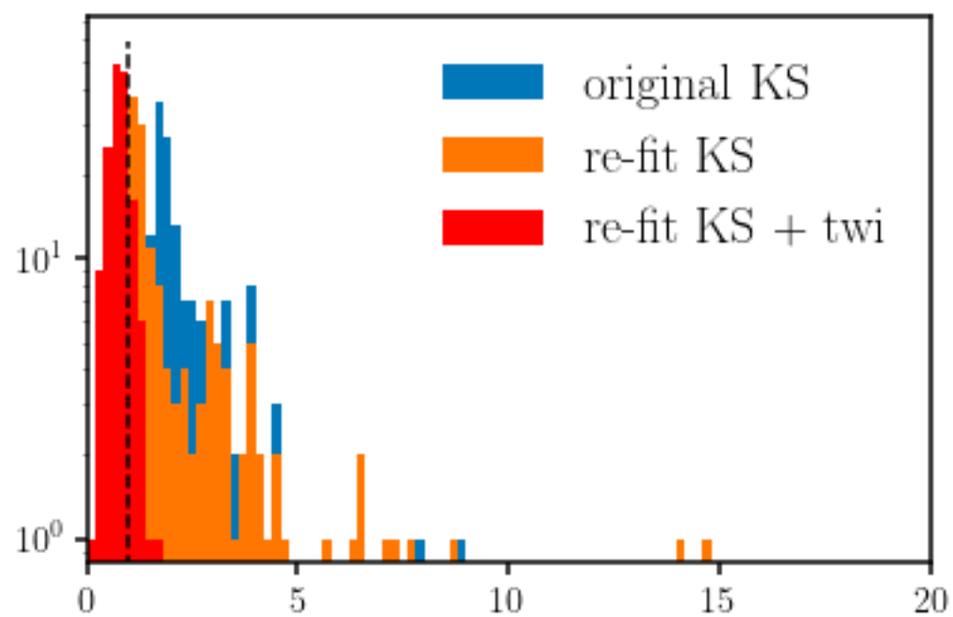


new sky model

old sky model

new sky model *= (UVES dark sky) + (re-fit Krisciunas & Schaefer 1991) + (twilight)*

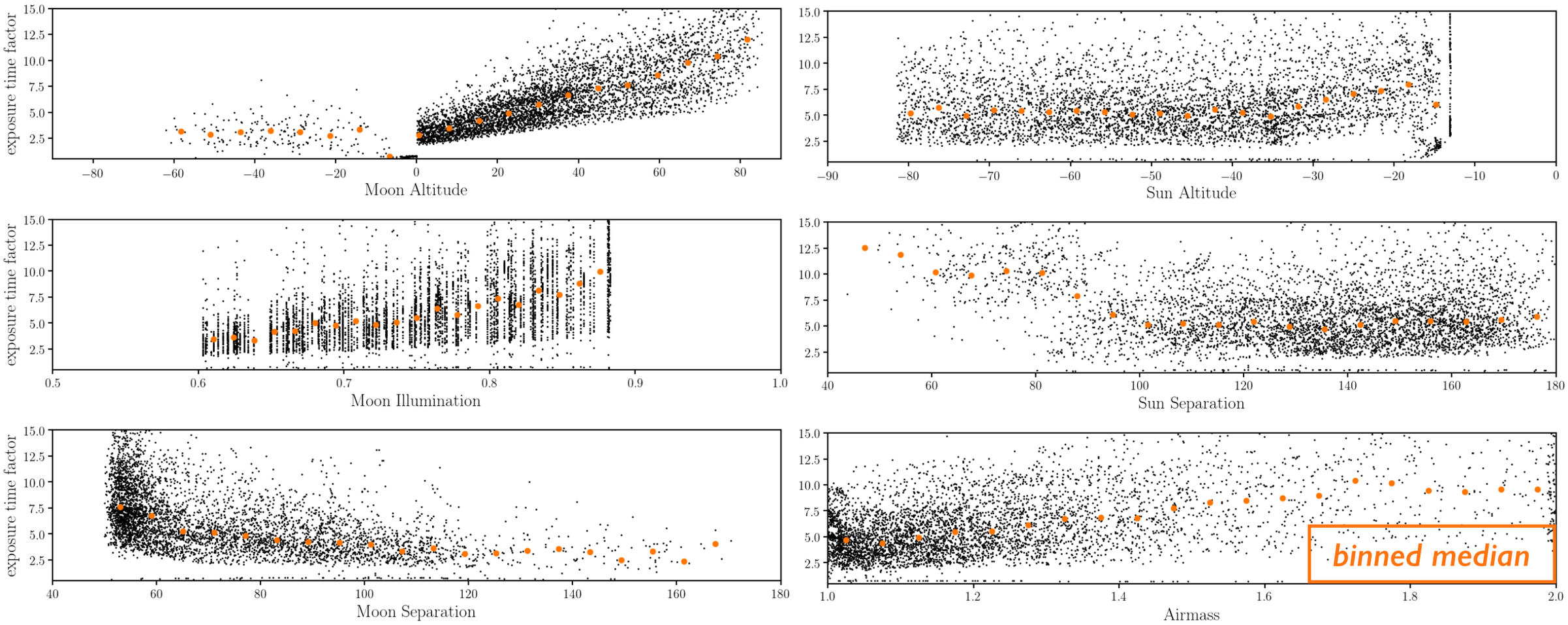




better reproduces sky flux from BOSS sky fibers and DECam sky exposures

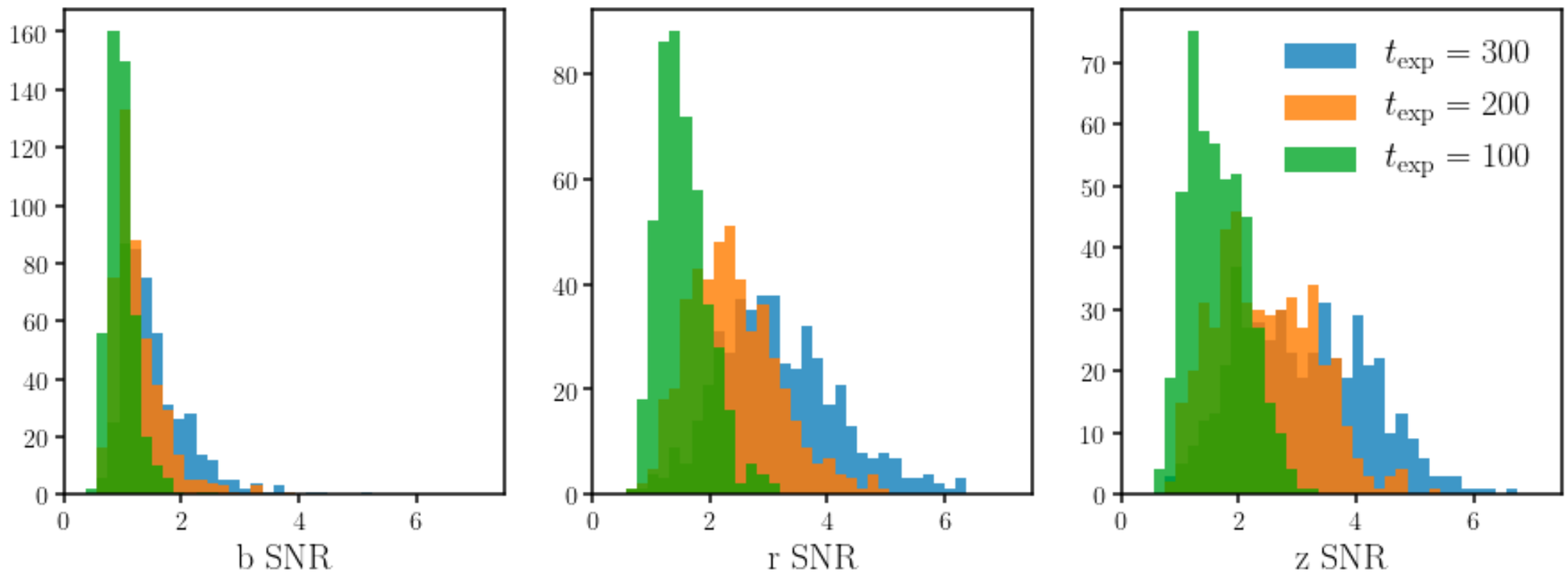
exposure time correction factor from the new sky model:

$$\frac{\text{bright exposure time}}{\text{nominal expsoure time}} = \frac{\text{bright sky}}{\text{nominal dark sky}}$$



t_{exp} can be estimated for bright times in ***`surveysim`*** *using exposure time correction factor Gaussian Process emulator*

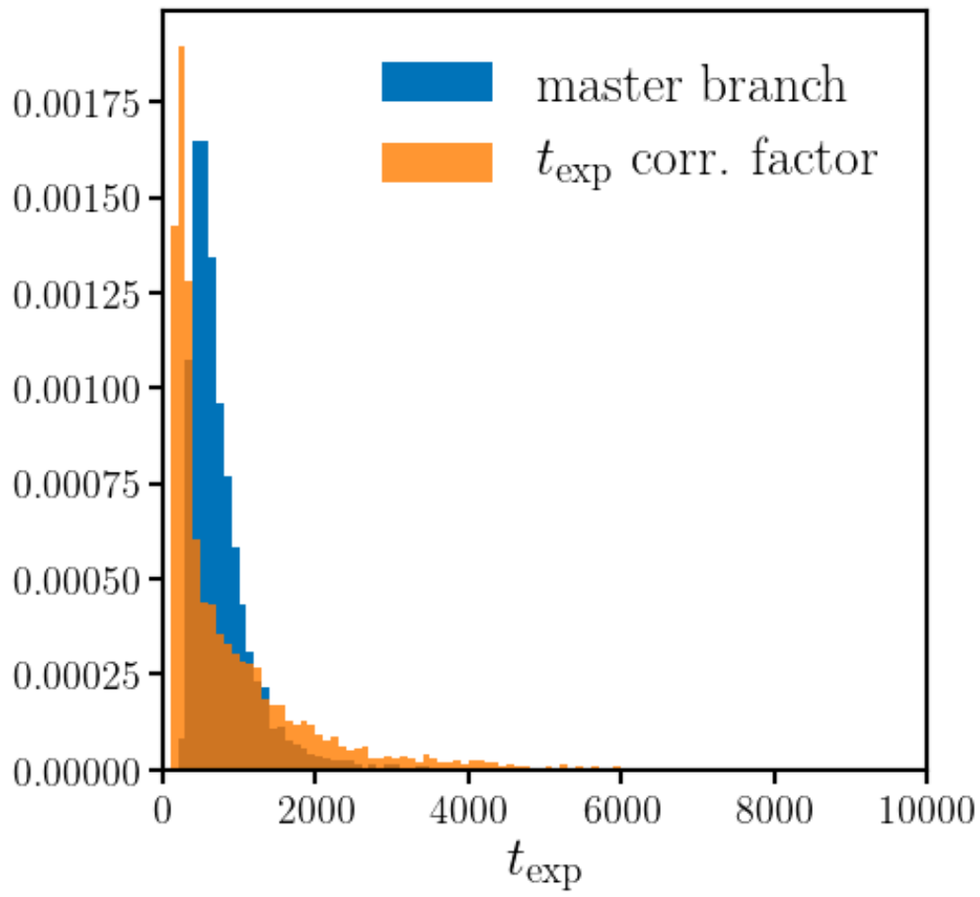
current default nominal t_{exp} = 300 sec but t_{exp} ~ 150 sec may be enough for BGS



SNR distribution of ~500 r~19.5 galaxy spectra observed during nominal dark sky for t_{exp} = 300, 200, and 100 sec

**assuming redshift completeness is high for r~19.5 galaxies with SNR~1*

more realistic ***surveysim*** *for bright time exposures*



original ***surveysim*** *fixed* t_{exp} *correction*

w/ bright sky t_{exp} *correction nominal* t_{exp} *= 150 sec*

exposure time distribution for bright exposures of ***surveysim*** *outputs*