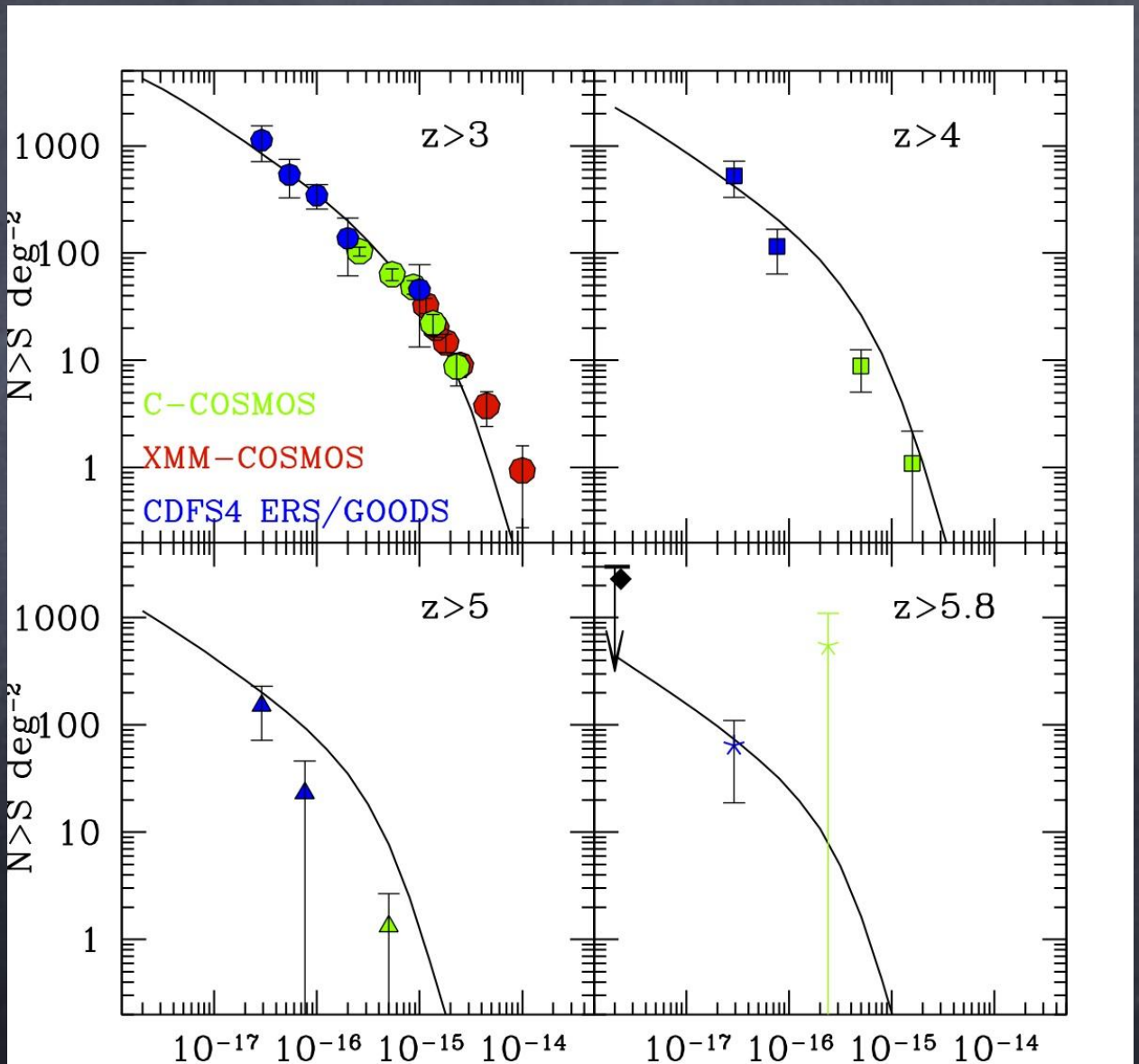
High-z AGN number counts



FF+ 2012

Prediction for future deep surveys

TABLE II: **Predicted number of faint, high-z X-ray sources**

Mission concept	PSF HPD arcsec	Mosaics	total FOV deg^2	z=4–5 LX(z=5)	z=5–5.8 LX(z=6)	z> 5.8 LX(z=7)
Athena*	10	60x0.2Msec	10	940 >43.3	480 >43.5	250 >43.6
Athena*	5	6x2Msec	1.0	360 >42.5	210 >42.6	125 >42.8
Athena	5	40x0.3Msec	7.0	1100 >43	650 >43.1	360 >43.2
WFXT*	10	24x0.5Msec	24	2300 >43.2	1300 >43.4	600 >43.5
WFXT*	5	4x3Msec	4	1200 >42.5	700 >42.6	400 >42.8
WFXT	5	60x0.2Msec	60	6000 >43.35	3200 >43.4	1600 >43.5
S-Chandra	2	6x2Msec	0.6	310 >42.2	185 >42.3	110 >42.5
S-Chandra	2	24x0.5Msec	2.4	390 >43	220 >43.1	125 >43.2
S-Chandra	1	2x6Msec	0.2	175 >41.8	100 >42.0	65 >42
S-Chandra	1	6x2Msec	0.6	350 >42.1	210 >42.2	120 >42.4

* close to confusion limit (40 beams per source).

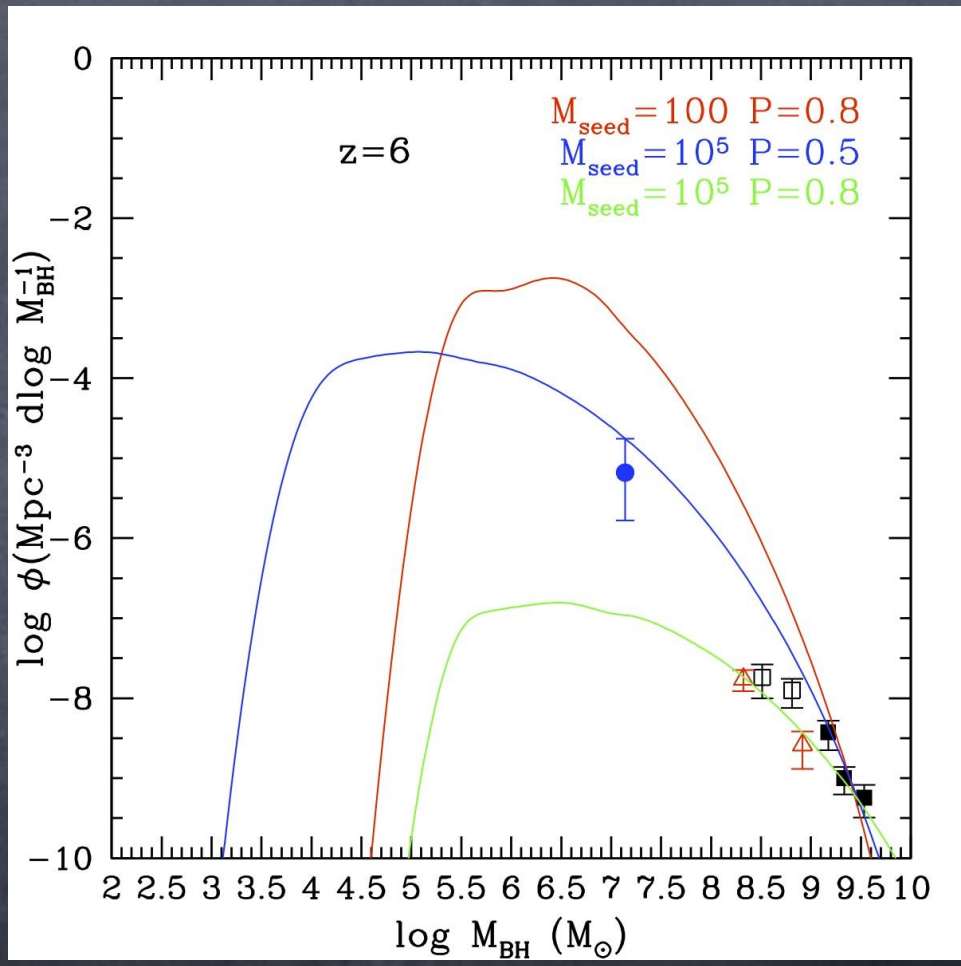
Chandra	1	24x2Msec	2.4	200 >42.8	150 > 43.0	60 >43.1
Chandra	1	12x4Msec	1.2	200 >42.5	100 >42.6	60>42.7

SMBH at z>6

- LX=10^{42} ergs/s ➔ Lbol~10^{43} ergs/s ➔ M_{BH}~10^5 M_{sun}
- Can we distinguish between a genuine large seed or a newly grew up PopIII star seed?
  - Statistic: BH mass functions
  - Direct: BH spin
  - Direct: Environment

SMBH at z>6

- Statistics: BH mass functions from PopIII star seeds are steeper than those from large seeds



SMBH at z>6

- Direct: Spin of BHs grew up mainly from accretion are faster than that of newly formed BH