

Supplementary Materials for

Simultaneous space and phase resolved X-ray polarimetry of the Crab Pulsar and Nebula

Niccolò Bucciantini, Riccardo Ferrazzoli, Matteo Bachetti, John Rankin, Niccolò Di Lalla, Carmelo Sgrò, Nicola Omodei, Takao Kitaguchi, Tsunefumi Mizuno, Shuichi Gunji, Eri Watanabe, Luca Baldini, Patrick Slane, Martin C. Weisskopf, Roger W. Romani, Andrea Possenti, Herman L. Marshall, Stefano Silvestri, Luigi Pacciani, Michela Negro, Fabio Muleri, Emma de Oña Wilhelmi, Fei Xie, Jeremy Heyl, Melissa Pesce-Rollins, Josephine Wong, Maura Pilia & the IXPE Collaboration

Correspondence to: niccolo.bucciantini@inaf.it

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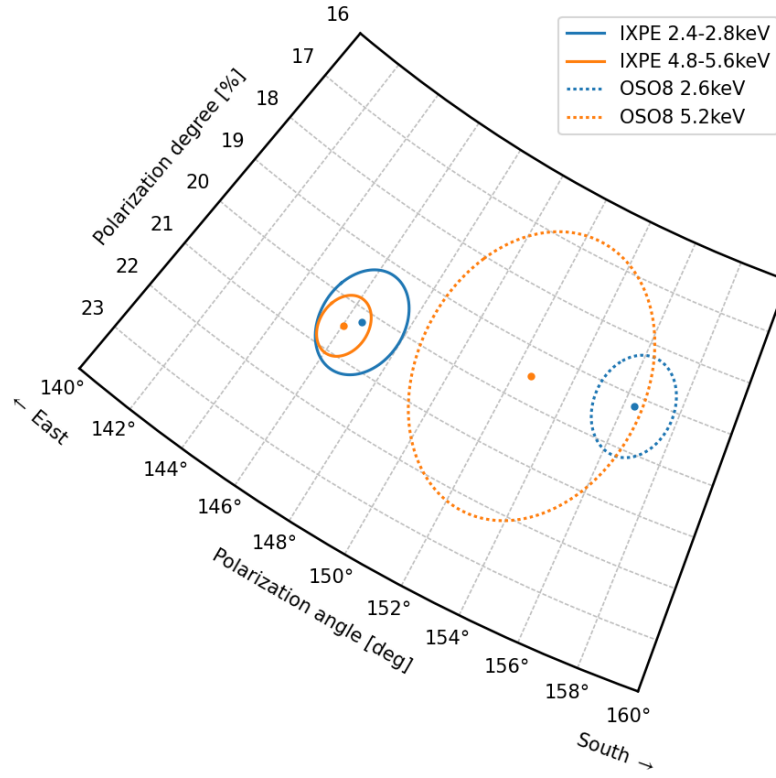


Fig. S1.

Comparison of the polarisation measured between IXPE and OSO-8 nearly 50 years before, both PSR subtracted, in a region of 110arcsec centered on the PSR, and covering the entire PWN. Contours are at 1σ confidence (67%). Spectral response of OSO-8 was strongly peaked in a narrow energy band, and for this reason we selected in the IXPE analysis only the events in two narrow energy bands bracketing the ones of OSO-8. The comparison shows that the polarisation degree measured by OSO-8 are fully in agreement with those measured by IXPE, whereas a rotation of the polarisation angle of about 10° is detected at more than 2σ confidence for the lower energy band, and at about 1σ level for the higher energy band.

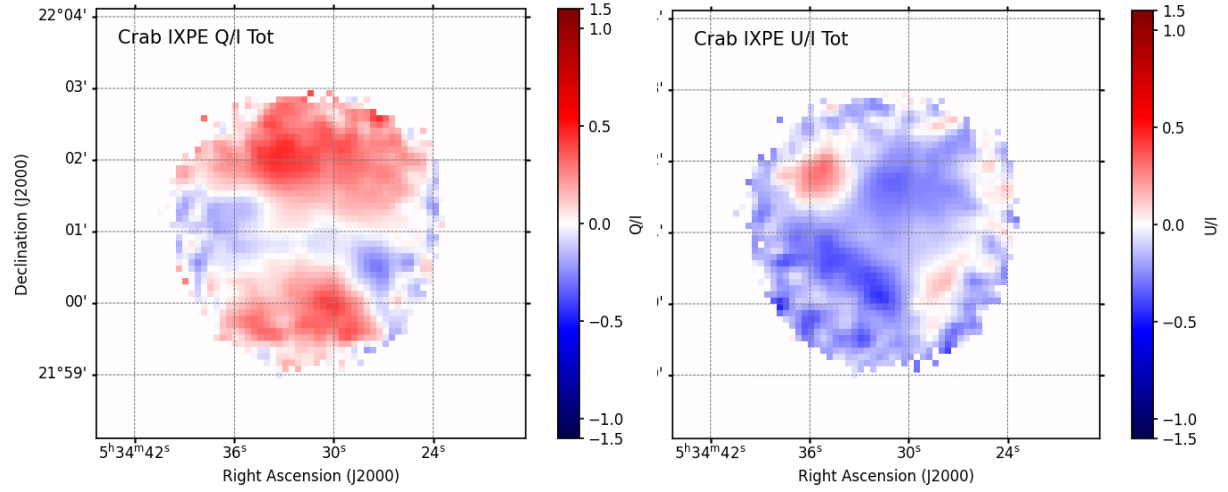


Fig. S2.

Maps of the total PWN & PSR normalised Stokes Parameters Q/I and U/I , in the [2-8] keV energy band, smoothed with a Gaussian kernel, and limited to pixels having intensity above 0.3% of the maximum.

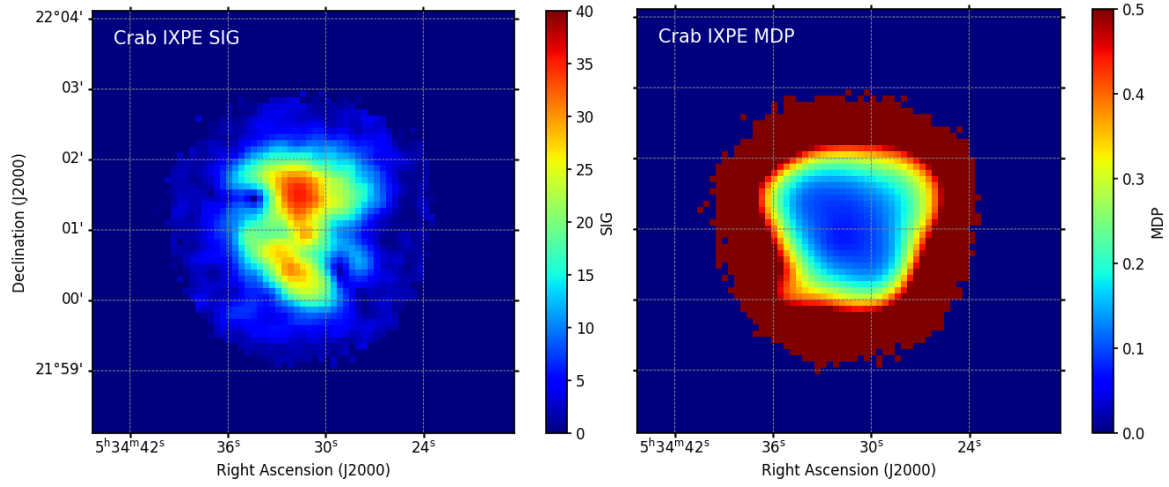


Fig. S3.

Left panel: map of the significance (ratio of polarised degree over its 1σ uncertainty) in the [2-8] keV energy band, smoothed with a Gaussian kernel, and limited to pixels having intensity above 0.3% of the maximum. Right panel: map of the Minimum Detectable Polarisation (MDP) at 99% confidence level in the same energy band.

PEPOCH (MJD)	59639.358974437835272
F0 (s)	29.5866194471(4)
F1	-3.67445(8)e-10
F2 (s ⁻¹)	-4(4) e-20

Table S1.

PSR ephemeris as determined from IXPE events time of arrival. F0 is the period, F1 the period time derivative, F2 the period second time derivative, all at PEPOCH. In brackets the 1σ errors on the last digit.

Phase Bin	Phase Range	Q/I	U/I
P1 left wing	[0.085-0.120]	-0.068(0.033)	-0.007(0.033)
P1 center	[0.120-0.140]	-0.132(0.025)	-0.079(0.025)
P1 right wing	[0.140-0.175]	0.044(0.038)	-0.003(0.038)
P2 left wing	[0.460-0.515]	-0.027(0.033)	-0.023(0.033)
P2 center	[0.515-0.545]	-0.013(0.030)	-0.06(0.030)
P2 right wing	[0.545- 0.600]	0.008(0.047)	-0.045(0.047)
Bridge	[0.200-0. 400]	0.056(0.081)	0.137(0.081)
Off-Pulse	[0.700-1.000]	-0.01606(0.008)	-0.241(0.008)

Table S2.

OP subtracted (and OP) polarisation properties of various phase bins (a phase offset has been added to shift P1 at phase 0.13, for ease of visualization). In brackets the 1σ errors. See also Figure 3.