

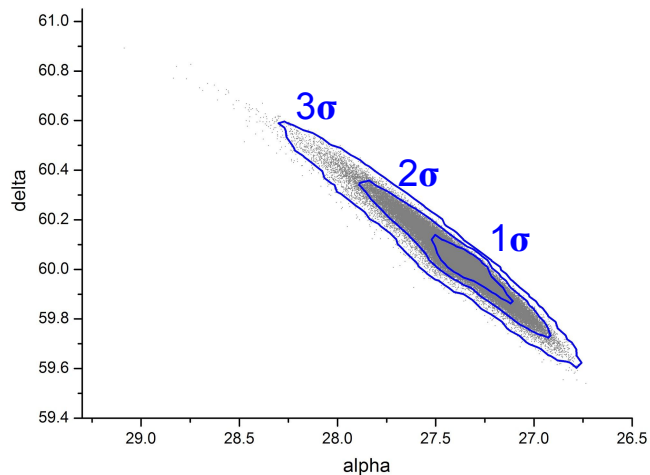
The search for isolated stellar-mass black hole candidates based on kinematics of pulsars - their former companions in disrupted binary systems

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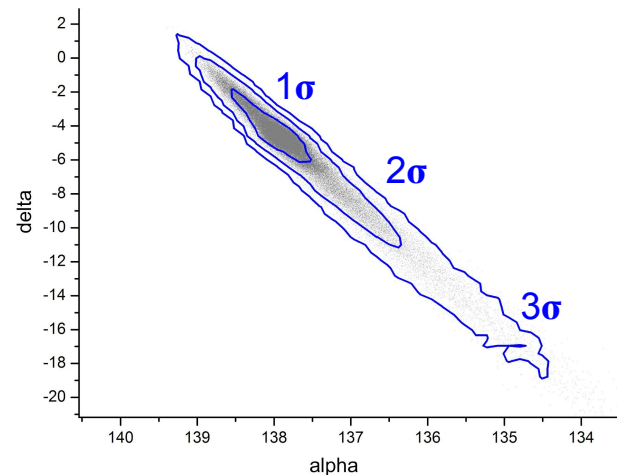
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We propose searching for isolated stellar-mass black hole (BH) candidates based on the fact that more than 50% of radio pulsars have originated in binary systems, now disrupted, where the other component could have evolved into a black hole prior to the second supernova event of the system, which caused its disruption. We selected isolated radio pulsars with known proper motions, parallaxes and relatively small characteristic ages that fit our criteria and traced their trajectories back to their presumed birth locations. These locations were then analyzed for possible BH candidates based on the available positional, photometric, and spectral data. We use the example of 2 pulsars from our sample, J0139+5814 and J0922+0638, to demonstrate the proposed method, and present the first results.

Probable birth location of J0139+5814



Probable birth location of J0922+0638



7 sources were selected for future study as stellar-mass black hole candidates

#	SOURCE ID	XRAY		UV		OPTICAL								IR				RADIO 1.4 GHz (mJy)	PM (mas/yr)	SIMBAD classification							
		0.1-2.4 keV		~130-280 nm		~450 nm	~550 nm	~660 nm	~390 nm	~460 nm	~610 nm	~740 nm	~890 nm	~806 nm	~1220 nm	~1630 nm	~2190 nm				~3.4 μm	~4.6 μm	~12 μm	~22 μm			
		(Ct/s)	HR1	HR2	FUV	NUV	B	V	R	u	g	r	i	z	l	J	H	K	W1	W2	W3	W4					
1	1RXS J091407.9-015949	0.03066	-0.5	1	21.031	20.223	19.0		18.7	19.90	19.55	19.28	19.06	18.97					15.713	15.108	12.304	8.312	8.04	0	Radio source		
2	1RXS J091249.6-034034	0.0180	-1	0		20.796	15.040	14.580	14.990											13.962	13.612	13.642			2.02	-9.8 (3.8) 0.2 (3.8)	X-ray source
3	1RXS J090939.1-051030	0.0307	0.835	0.145	20.265	18.796	18.0		17.9						18.465									9.09	0	QSO?	
4	1RXS J091052.4-061129	0.0194	-1	0	21.483	19.905	18.4		18.8						18.30				14.368	13.450	11.370	8.961	24.45	6.3 (7.0) -11.1 (7.0)	Radio source		
5	1RXS J090809.5-072652	0.0269	0.19	-0.27	21.707	21.679	19.3		16.6						15.88	15.777	14.90	14.359	13.713	13.437	12.482	9.128	9.87	0	Candidate HSP blazar		
6	SDSS J091605.73+000802.2				17.60	17.89	17.710	17.970	19.570	18.53	18.66	19.11	19.35	19.47		19.123	18.899	18.643						0	-7.06 (3.11) -5.62 (3.11)	Blue object	
7	WD 0913+005					20.609	20.220		20.190	19.73	19.60	19.67	19.76	20.00		19.805	19.66							0	42.5 (12.4)	WD	