“Magnetar” or “Quarctar”: Do \magnetars" really exist?

Qiao,G.J. [1] , Liu, X.W. [1], Xu,R.X.[1], Du,Y.J.[2-3], and Han,J.L.[2]

1. gjn@pku.edu.cn; xiongwliu@163.com; r.x.xu@pku.edu.cn, Peking University,
2. dyj@nao.cas.cn; hjl@nao.cas.cn, National Astronomical Observatories, China
3. dyj@nao.cas.cn, Center for Space Science and Applied Research, China

It is arguing that from both X-ray and radio observations shown that there are argued with “anti-magnetars” and a lot of observations are difficult to be understood in “magnetars” model.

Insted of of “magnetar” it is suggested as “Quarctar”, that is a quark star with a crust/disk. In this model the persistent X-ray emission, burst lumi-nosity, spectrum of AXPs and SGRs can be understood. Both radio and X-ray emission from some AXPs also can be explained in this model. Most problems faced by the “magnetars” can also be overcame in the “Quarctar” model.

Challenge to magnetar

- Radio pulsar J1847-0130 — Anti-Magnetar:
  - PSR J1718-3718: B~9.4 × 10^13 G ; B~7.4 × 10^13 G
  - PSR J1852+0040: Lx = 18 E_dot; Lx > E_dot; Bs = 3.1×10^10 G

strong B≠》 strong X-ray radiation

strong radiation≠》 strong B

Radio: XTE J1810–197, AXP 1E 1547.05408…

Magnetar: characteristic age & age of host SNR

Name	P (s)	$\dot{P}$ (s·s^{-1})	τ_c (yr)	τ_{host} (yr)	Host
SGR 1806-20	7.46	10e-10	1.2e3	(3-5)e6	MSC (a)
SGR 1900+14	5.16	10e-10	0.8e3	(1-10)e6	SNR: CTB 109 (b)
1E 2259+586	7.0	4.84e-13	2.28e5	1.7e4	SNR: CTB 109 (c)

CCO: characteristic age different from age of host SNR

Name	P (ms)	$\dot{P}$ (s·s^{-1})	τ_c (yr)	τ_{host} (yr)	Host
PSR J1852+0040	105	8.7e-18	192e6	~ 7e3	Kes 75 (a)
1E 1207.4.5209	424	6.6e-17	>27e6	~ 7e3	SNR PKS 1209.51/52 (b)
RX J0822-4300	112	<8.3e-15	>0.22e6	3.7e3	SNR Puppis A (c)

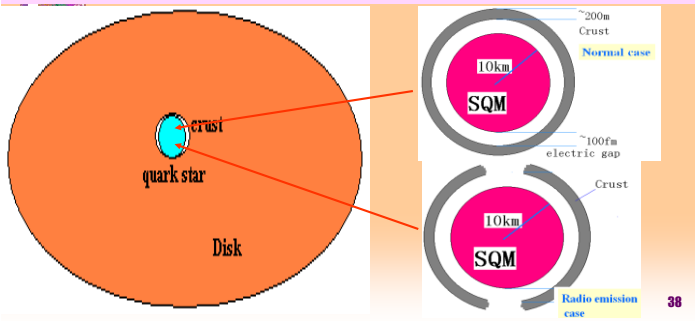
Table 1: high-B radio pulsars and anti-magnetar.

Name	P (s)	P (s·s^{-1})	Age (yr)	B_s (G)	Note
PSR J1847-0130	6.7	1.3e-12	8.2e4	9.4e13	No X-ray[a]
PSR J1718-3718	3.3	1.5e-12	3.5e4	7.4e13	$\dot{E} = 1.6 \times 10^{33}$; Low X-ray[b]
PSR J1814-1733	4.0	7.4e-13	8.6e4	5.5e13	No X-ray[c]
RRAT J1819-1458	4.26	5.8e-13	0.1e6	5.0e13	$\dot{E} = 3.0 \times 10^{32}$[d]
PSR J1846-0258	0.324	7.1e-12	8.84e2	4.9e13	$\dot{E} = 8.3 \times 10^{36}$; $L_X/\dot{E} = 5\%$; SNR Kes75; No radio[e]
PSR J1852+0040	0.105	8.68e-18	1.9e8	3.1e10	$L_X/\dot{E} = 17.7$; Anti-magnetar;No radio[f]

AXP/SGR: Magnetar or Quarctar?

Energy source: glitch of quark star

Xu et al., 2006, MN



Compact stars in the QCD phase diagram II (CSQCD II)
May 20-24, 2009, KIAA at Peking University, Beijing - P. R. China
http://vega.bac.pku.edu.cn/rxxu/csqcd.htm

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