The Modern Physics of Compact Stars and Relativistic Gravity 2017

Stability and mass defect of hot quark stars.

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$$P = \sum P_i - B, \qquad \varepsilon = \sum \varepsilon_i + B, \tag{18}$$

$$P_i = \frac{1}{4\pi^2}\mu_{0i}^4\left(1 - 3\left(\frac{m_i}{\mu_{0i}}\right)^2 + \frac{2\pi^2}{3}\left(\frac{T}{\mu_{0i}}\right)^2\right), \tag{19}$$

$$\varepsilon_i = \frac{3}{4\pi^2}\mu_{0i}^4\left(1 - \left(\frac{m_i}{\mu_{0i}}\right)^2 + \frac{2\pi^2}{3}\left(\frac{T}{\mu_{0i}}\right)^2\right), \tag{20}$$

$$\varepsilon_i = 3P_i = \frac{1}{\pi^2}\int_0^\infty \frac{p^3 dp}{1 + \exp\left[\left(p - \mu_i\right)/T\right]} \equiv$$

$$\equiv \frac{T^4}{\pi^2}\int_0^\infty \frac{x^3 dx}{1 + \exp\left(x \mp Z/\Theta\right)} \equiv \frac{T^4}{\pi^2} F\left(\pm \frac{Z}{\Theta}\right) \tag{21}$$

$$\varepsilon = 3P + \frac{\mu_0^4}{2\pi^2}\beta^2 Y^2 + 4B,$$

$$\frac{dr}{dP} = -\frac{r^2}{Gm}\frac{c^2}{\varepsilon}\left(1-\frac{2Gm}{rc^2}\right) \Big/ \left(1+\frac{P}{\varepsilon}\right)\left(1+\frac{4\pi r^3 P}{mc^2}\right) ,$$

$$\frac{dm}{dP} = 4\pi r^2 \frac{\varepsilon}{c^2}\frac{dr}{dP} ,$$

$$\frac{d\nu}{dP} = -\frac{2}{\varepsilon + P} ,$$

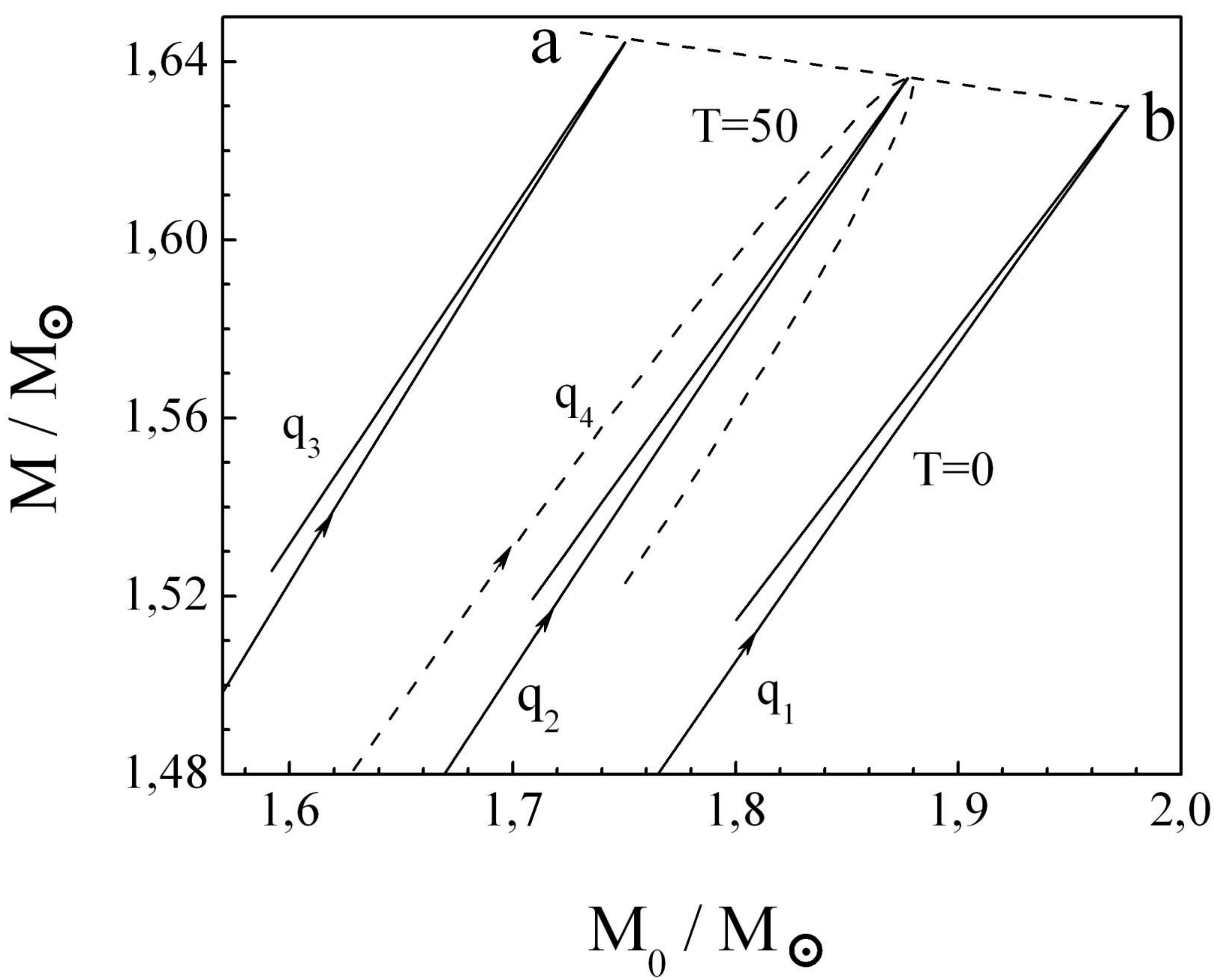
$$T e^{\nu/2} = const ,$$

$$S_b = \frac{S_q}{n} = \frac{T}{\mu_0} \qquad \mu_0 = \mu_u + \mu_d + \mu_s$$

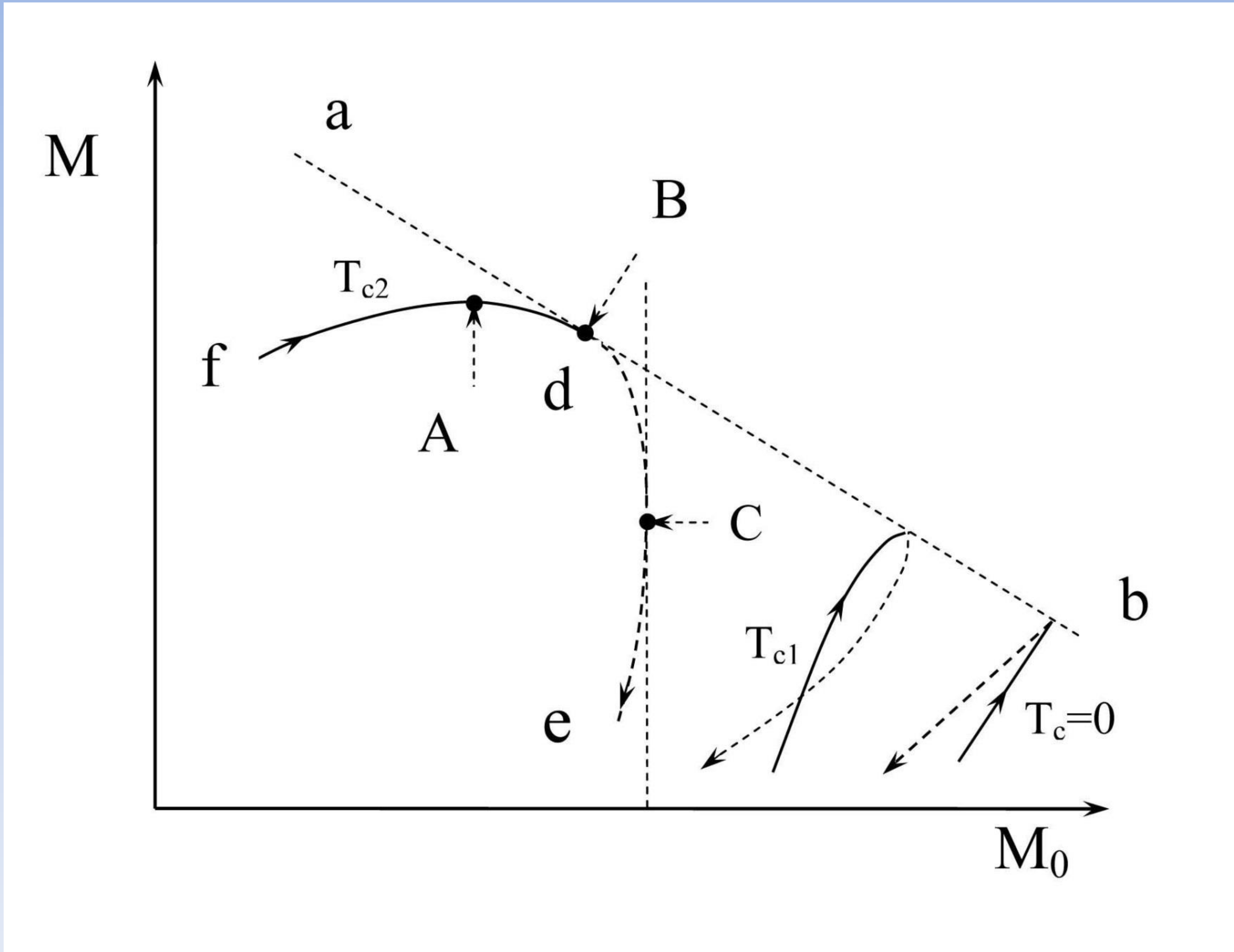
$$\mu_0 \sqrt{g_{00}} = const \qquad T\sqrt{g_{00}} = const \,,$$

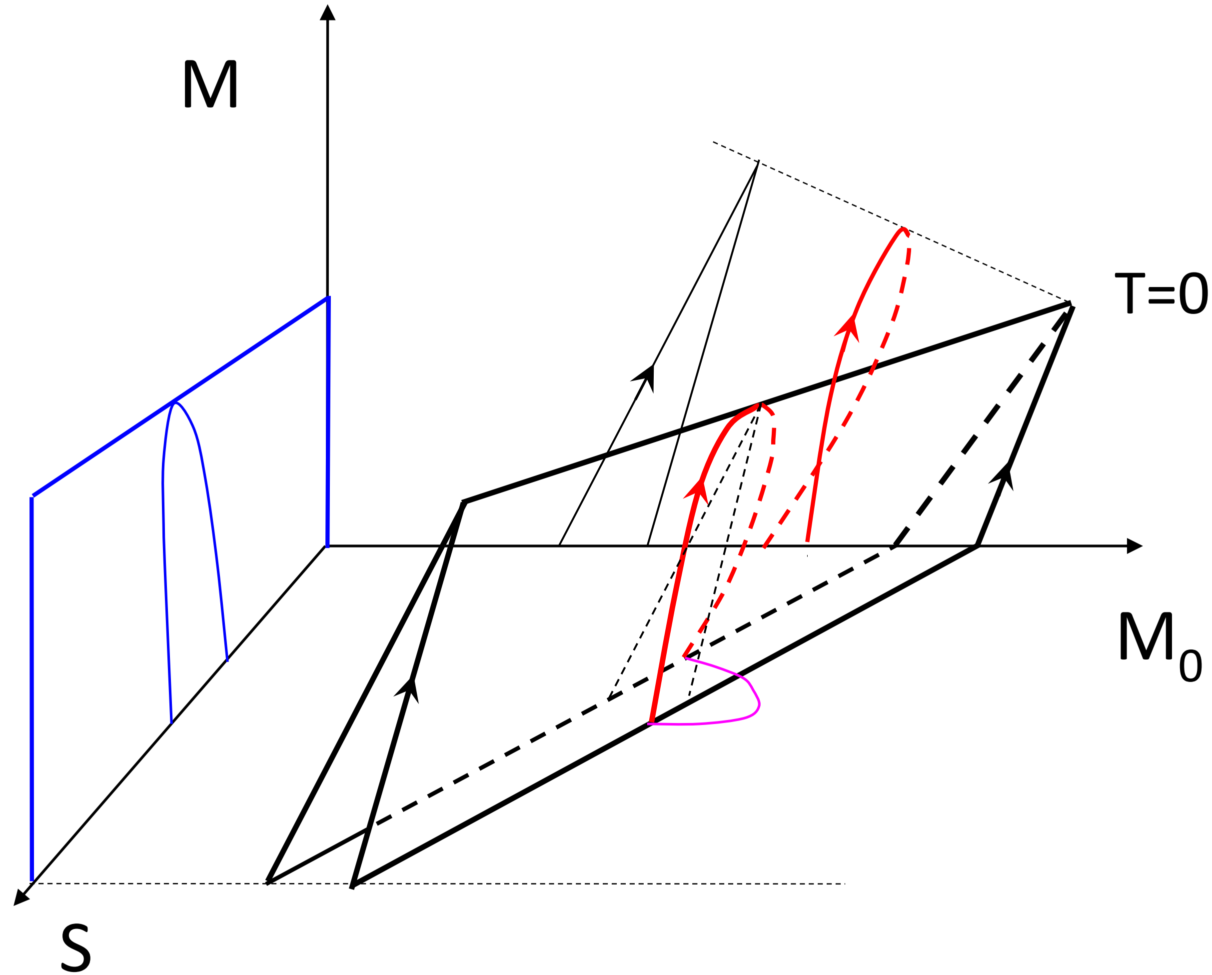
$$M = 4\pi \int_0^R \rho\, r^2 dr \,, \qquad N = 4\pi \int_0^R n\, e^{\lambda/2} r^2 dr \,, \qquad M_0 = m_0 N$$

$$\Delta M = M_0 - M \,.$$

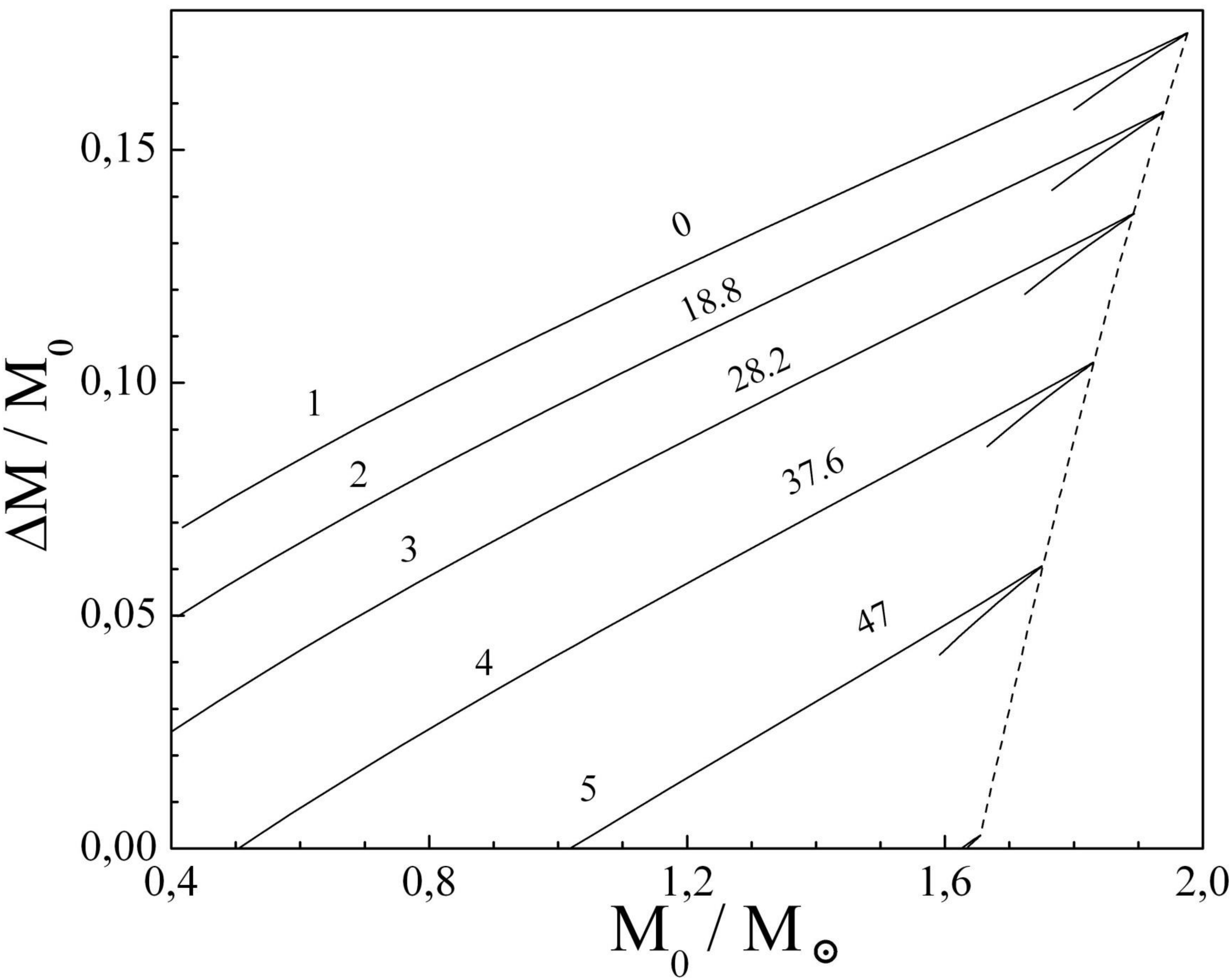


a
b
T=50
T=0
q_1
q_2
q_3
q_4
1,48
1,52
1,56
1,60
1,64
1,6
1,7
1,8
1,9
2,0
$M / M_\odot$
$M_0 / M_\odot$


M
a
B
T_{c2}
f
d
A
C
b
T_{c1}
e
$T_c=0$
M_0



M
T=0
M0
S



ΔM / M0
0,15
0,10
0,05
0,00
0,4
0,8
1,2
1,6
2,0
M0 / M⊙
0
18.8
28.2
37.6
47
1
2
3
4
5


Thank you
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