A&A 485, 153 (2008)
DOI: 10.1051/0004-6361:200809529

Astronomy & Astrophysics

Erratum

New solution to viscous evolution of accretion disks in binary systems

G. V. Lipunova and N. I. Shakura

Sternberg Astronomical Institute, Moscow State University, Universitetskij pr. 13, 119992 Moscow, Russia
e-mail: galja@sai.msu.ru

A&A 356, 363–372 (2000)

We find several mistakes that affect the physical precision of some of our formulae but not the principal conclusions of our work (A&A 356, 363–372 (2000)). The derived law of accretion disk evolution is correct, although some numerical factors in the resulting expressions for physical parameters require an update. The rest of the corrections apply to the notations in the equations.

Key words. errata, addenda – accretion, accretion disks – stars: binaries: close – stars: novae, cataclysmic variables – X-rays: bursts

The first equation in the last line of the set of Eqs. (17) should read:

$$\frac{\mathrm{d}\theta}{\mathrm{d}\sigma} = \Pi_4 \, \frac{q\, j^{\zeta}}{\theta^{\nu+3}}.$$

Equation (19) contained an error of a factor of 2 and should read instead:

$$\delta = \frac{\varkappa_{\mathrm{T}}\, \Sigma_{\mathrm{o}}/2}{\tau_{\mathrm{T}}(\tau^* = 1)}.$$

In Eqs. (26) and (31) we did not provide the normalization of μ and gave incorrect numerical factors. The correct version of the formulae in these equations is:

$$D\left[\mathrm{g}^{-2/5}\,\mathrm{cm}^{28/5}\,\mathrm{s}^{-17/5}\right] = 2.42\times10^{38}\,\alpha^{4/5}\,m_{\mathrm{x}}^{6/5} \times \left(\frac{\mu}{0.5}\right)^{-4/5}\left(\Pi_3^4\,\Pi_4\right)^{-1/5}, \qquad (26)$$

$$D\left[\mathrm{g}^{-3/10}\,\mathrm{cm}^{5}\,\mathrm{s}^{-16/5}\right] = 5.04\times10^{34}\,\alpha^{4/5}\,m_{\mathrm{x}} \times \left(\frac{\mu}{0.5}\right)^{-3/4}\left(\Pi_1^{1/2}\,\Pi_2\,\Pi_3^8\,\Pi_4\right)^{-1/10}. \qquad (31)$$

In Eqs. (29) and (34), we now present new numerical factors:

$$\frac{Z_{\mathrm{o}}}{r} = 0.04\,\alpha^{-1/2}\,m_{\mathrm{x}}^{-1/4}\left(\frac{r}{r_{\mathrm{out}}}\right)^{-1/20} f^{1/5}\left(\frac{r_{\mathrm{out}}}{R_\odot}\right)^{3/4} \times\left(\frac{t}{10^{\mathrm{d}}}\right)^{-1/2}\left(\Pi_1\,\Pi_3\right)^{1/2}, \qquad (29)$$

$$\frac{Z_{\mathrm{o}}}{r} = 0.05\,\alpha^{-1/2}\,m_{\mathrm{x}}^{-1/4}\left(\frac{r}{r_{\mathrm{out}}}\right)^{1/20} f^{3/20}\left(\frac{r_{\mathrm{out}}}{R_\odot}\right)^{3/4} \times\left(\frac{t+t_0}{10^{\mathrm{d}}}\right)^{-1/2}\left(\Pi_1\,\Pi_3\right)^{1/2}. \qquad (34)$$

In Eq. (32), the exponent of the term $(t+t_0)$ changed:

$$\Sigma_o\left[\mathrm{g\,cm}^{-2}\right] = 5.3\times10^{2}\,\alpha^{-8/3}\,m_{\mathrm{x}}^{5/6}\left(\frac{\mu}{0.5}\right)^{5/2}\left(\frac{r}{r_{\mathrm{out}}}\right)^{-11/10} f^{7/10} \times\left(\frac{r_{\mathrm{out}}}{R_\odot}\right)^{13/6}\left(\frac{t+t_0}{10^{\mathrm{d}}}\right)^{-7/3}\left(\Pi_1^{1/2}\,\Pi_2\,\Pi_3^8\,\Pi_4\right)^{1/3}.$$

In Eq. (46), the dimensionless value z is corrected to be instead the height Z:

$$W_{r\varphi}(r,t) = 2\int_0^{Z_{\mathrm{o}}} w_{r\varphi}\,\mathrm{d}Z = -2\int_0^{Z_{\mathrm{o}}} \rho\nu_{\mathrm{t}}\,\frac{\partial\omega}{\partial r}\,r\,\mathrm{d}Z = -\frac{\partial\omega}{\partial r}\,r\,\Sigma_{\mathrm{o}}\,\bar{\nu}_{\mathrm{t}}.$$

Article published by EDP Sciences