Advanced Magnetohydrodynamics, by Hans Goedbloed, Rony Keppens and Stefaan Poedts (Cambridge University Press, 2010)

Errata, 17 May 2017

– p. 3, 4rd line from bottom page:

"Section 14.3" $\Rightarrow$ "Section 14.4"

– p. 25, Eq. (12.80):

Replace 1st term on 3rd line by $+\frac{1}{2}\boldsymbol{\eta}\cdot[\nabla\cdot(\boldsymbol{\xi}\rho\mathbf{v}\cdot\nabla\mathbf{v})]+\frac{1}{2}\boldsymbol{\xi}\cdot[\nabla\cdot(\boldsymbol{\eta}\rho\mathbf{v}\cdot\nabla\mathbf{v})]$, delete 1st term of 5th line (inside divergence).

– p. 25, Eq. (12.82):

Replace 1st term on 4th line by $-\frac{1}{2}\boldsymbol{\eta}\cdot[\nabla\cdot(\boldsymbol{\xi}\rho\mathbf{v}\cdot\nabla\mathbf{v})]-\frac{1}{2}\boldsymbol{\xi}\cdot[\nabla\cdot(\boldsymbol{\eta}\rho\mathbf{v}\cdot\nabla\mathbf{v})]$, delete 2nd term of 5th line (surface integral).

– p. 26 and 27, Eq. (12.88):

Replace 1st term on 4th line by $-\frac{1}{2}\boldsymbol{\eta}\cdot[\nabla\cdot(\boldsymbol{\xi}\rho\mathbf{v}\cdot\nabla\mathbf{v})]-\frac{1}{2}\boldsymbol{\xi}\cdot[\nabla\cdot(\boldsymbol{\eta}\rho\mathbf{v}\cdot\nabla\mathbf{v})]$,
delete 2nd term of 5th line (surface integral),
replace 1st term on last line by $-\frac{1}{2}\hat{\boldsymbol{\eta}}\cdot[\nabla\cdot(\hat{\boldsymbol{\xi}}\hat{\rho}\hat{\mathbf{v}}\cdot\nabla\hat{\mathbf{v}})]-\frac{1}{2}\hat{\boldsymbol{\xi}}\cdot[\nabla\cdot(\hat{\boldsymbol{\eta}}\hat{\rho}\hat{\mathbf{v}}\cdot\nabla\hat{\mathbf{v}})]$.

– p. 30, Eq. (12.103), Eq. (12.104) and text:

Replace 1st term on 3rd line of Eq. (12.103) by $-\boldsymbol{\xi}^*\cdot[\nabla\cdot(\boldsymbol{\xi}\rho\mathbf{v}\cdot\nabla\mathbf{v})]$,
delete 2nd term of Eq. (12.104),
delete text "The surface integral . . . field lines)." (lines 10 – 4 from the bottom).

– p. 44, Eq. (12.146):

in the RHS: factor "2" $\Rightarrow$ "2ρ"

– p. 45, 3rd line above and line below Eq. (12.153):

"monotonic" $\Rightarrow$ "definite"

– p. 46, 5th line from above:

"monotonicity" $\Rightarrow$ "definiteness"

– p. 92, Eq. (13.93) and Eq. (13.94):

$2|\Pi_\alpha|^2 \;\Rightarrow\; |\Pi_\alpha|^2$
$2\nu_\alpha \;\Rightarrow\; 4\nu_\alpha$ (twice)

– p. 94, lines after Eq. (13.103):

$\mathbf{H}_\mathrm{A} \;\Rightarrow\; \mathbf{H}_a$ (thrice)

– p. 108, Fig. 13.14:

There are five (instead of six) unstable eigenvalues, both for the static case (a), and for the rigidly rotating case (b). For case (a), the corrected eigenvalues are $\sigma = 0$, ν = 0.3155, 0.2299, 0.1724, 0.1258 and 0.8091. For case (b), they are (σ, ν) = $(-0.5872, 0.3032)$, $(-0.5580, 0.2225)$, $(-0.5435, 0.1668)$, $(-0.5348, 0.1208)$ and $(-0.5290, 0.7550)$.

– p. 110, Fig. 13.15:

For the value $\lambda = 0.84$, there should be four (instead of three) unstable eigenvalues on the circle, there is no "intruder" mode labelled 1 in that case. If the value of λ is increased to 0.92, a stable "intruder" mode 1 ($\sigma = -2.102$) appears and two unstable modes 2 ($\sigma = -2.054$, $\nu = 0.0851$) and 3 ($\sigma = -2.000$, $\nu = 0.0633$) appear on the circle. The text on p. 110 then applies without change. The three rightmost eigenvalues become $\sigma \approx -1.263, -1.116, -0.785$.

– p. 111, Eq. (13.169):

$< 1 \;\Rightarrow\; > 1$

– p. 107–112, Section 13.4.1:

The unstable eigenvalues of the rigidly rotating cylindrical plasma with constant pitch magnetic field are located on the circle given by Eqs. (13.161), (13.165). Contrary to what is repeatedly stated in the text of Section 13.4.1, this circle is *not* a solution path in the sense of Section 12.3 (which demands $W_2 = 0$), but just a convenient auxiliary curve obtained for the very special case of the Bessel function solutions (13.156). Actually, $W_2 \neq 0$ on that circle.

– p. 116, line after Eq. (13.185):

$r_\mathrm{A} \;\Rightarrow\; r_a$

– p. 120, 9th line from below:

"over the central part of the imaginary axis" $\Rightarrow$ "over the solution path that slightly (not visibly) deviates [53] from the central part of the imaginary ω axis"

– p. 150, Eq. (14.92):

$$\frac{\omega^2}{\epsilon^2 \tau_\mathrm{A}^2} \;\Rightarrow\; \frac{\tau_\mathrm{A}^2}{\epsilon^2}\omega^2$$

– p. 151, Eq. (14.93):

$\tau_{\rm A} \equiv \frac{v_{\rm A}}{a} = \frac{B_0}{a\sqrt{\mu_0\rho_0}} \;\Rightarrow\; \tau_{\rm A} \equiv \frac{a}{v_{\rm A}} = \frac{a\sqrt{\mu_0\rho_0}}{B_0}$

– p. 151, Eq. (14.94):

Add a term $-\frac{2r}{m}(n+m/q)(1/q)'$ in the second square bracket, and add "with constant density," to the line above this equation.

– p. 152, Eq. (14.99):

$[\![\mathbf{n}\cdot\nabla\hat{\mathbf{Q}}]\!] \;\Rightarrow\; \mathbf{n}\cdot[\![\nabla\hat{\mathbf{Q}}]\!]\cdot\mathbf{n}$

– p. 152, Eq. (14.101):

$b \;\Rightarrow\; w$

– p. 152, last line:

$(14.97) \;\Rightarrow\; (14.96)$

– p. 153, line below Eq. (14.106):

dispe rsion $\Rightarrow$ dispersion

– p. 153, Eq. (14.108):

$\Big(\frac{{\rm i}\omega}{\epsilon\tau_{\rm A}}\Big)^2 \;\Rightarrow\; \Big(\frac{{\rm i}\tau_{\rm A}\omega}{\epsilon}\Big)^2$ (twice)

– p. 154, Eq. (14.110):

$\pm\epsilon\tau_{\rm A}E \;\Rightarrow\; \pm(\epsilon/\tau_{\rm A})\sqrt{E}$

– p. 288, 3rd line of Eq. (16.164):

RHS of the expression for $\alpha\mathbf{j}_{\rm p}$ should be multiplied with $\mathbf{B}_{\rm p}$.

– p. 293, Eqs. (16.184) and (16.185):

$$z(w) = \frac{w+\delta}{1+\delta z} \;\Rightarrow\; z(w) = \frac{w+\delta}{1+\delta w}$$

$$\frac{1}{h^2}\Big(\frac{1}{s}\frac{\partial}{\partial s}\,s\,\frac{\partial\psi}{\partial s}\Big) \;\Rightarrow\; \frac{1}{h^2}\Big(\frac{1}{s}\frac{\partial}{\partial s}\,s\,\frac{\partial\psi}{\partial s} + \frac{1}{s^2}\frac{\partial^2\psi}{\partial t^2}\Big)$$

– p. 375, Eq. (18.76):

omit second $\mathbf{v}$

– p. 465, 3rd line from below:

graviofofofoftational $\Rightarrow$ gravitational

– p. 495, 7th line from above:

$(\equiv \rho_1/\rho_2) \;\Rightarrow\; (\equiv 1-\rho_1/\rho_2)$

– p. 496, 3rd line:

downstream $\Rightarrow$ upstream

– p. 513, last line of Eq. (20.71):

$r \equiv -\dfrac{\tan^2\vartheta_1}{\gamma+1} \;\Rightarrow\; r \equiv -\dfrac{\Delta_1 \tan^2\vartheta_1}{\gamma+1}$

– p. 620, Ref. [331]:

critére $\Rightarrow$ critère

– p. 621, Ref. [358]:

11 (1974) $\Rightarrow$ **18** (1975)

We acknowledge constructive criticism by Antoine Cerfon and Ryan White. Please communicate further comments to: goedbloed@differ.nl.