Corrections for the WRF Version 3 Tech Note, 24 October 2011.

Page 10, added map scale factors to pressure gradient terms:

$$\partial_t U + m_x \left[\partial_x(Uu) + \partial_y(Vu)\right] + \partial_\eta(\Omega u) + (m_x/m_y)[\mu_d \alpha \partial_x p + (\alpha/\alpha_d)\partial_\eta p \partial_x \phi] = F_U \quad (2.23)$$

$$\partial_t V + m_y \left[\partial_x(Uv) + \partial_y(Vv)\right] + (m_y/m_x)\partial_\eta(\Omega v) + (m_y/m_x)[\mu_d \alpha \partial_y p + (\alpha/\alpha_d)\partial_\eta p \partial_y \phi] = F_V \quad (2.24)$$

Page 11, 4th line from bottom, change $\alpha = \overline{\alpha}(\overline{z}) + \alpha'$ to $\alpha_d = \overline{\alpha_d}(\overline{z}) + \alpha'_d$.
Page 12, added map scale factors to pressure gradient terms, **pressure gradient now written as it appears in the ARW code and Klemp et al 2007:**

$$\begin{aligned} \partial_t U + & m_x \left[\partial_x(Uu) + \partial_y(Vu)\right] + \partial_\eta(\Omega u) \\ & + (m_x/m_y)(\alpha/\alpha_d)\left[\mu_d(\partial_x \phi' + \alpha_d \partial_x p' + \alpha'_d \partial_x \overline{p}) + \partial_x \phi(\partial_\eta p' - \mu'_d)\right] = F_U \quad (2.38) \\ \partial_t V + & m_y \left[\partial_x(Uv) + \partial_y(Vv)\right] + (m_y/m_x)\partial_\eta(\Omega v) \\ & + (m_y/m_x)(\alpha/\alpha_d)\left[\mu_d(\partial_y \phi' + \alpha_d \partial_y p' + \alpha'_d \partial_y \overline{p}) + \partial_y \phi(\partial_\eta p' - \mu'_d)\right] = F_V \quad (2.39) \end{aligned}$$

Page 15, added map scale factors to pressure gradient terms, reordered terms to better match Klemp et al 2007:

$$\partial_t U'' + (m_x/m_y)(\alpha^{t^*}/\alpha_d^{t^*})\left[\mu_d^{t^*}\left(\alpha_d^{t^*}\partial_x p''^\tau + \alpha_d''^\tau \partial_x \overline{p} + \partial_x \phi''^\tau\right) + \partial_x \phi^{t^*}\left(\partial_\eta p'' - \mu_d''\right)^\tau\right] = R_U^{t^*} \quad (3.7)$$

$$\partial_t V'' + (m_y/m_x)(\alpha^{t^*}/\alpha_d^{t^*})\left[\mu_d^{t^*}\left(\alpha_d^{t^*}\partial_y p''^\tau + \alpha_d''^\tau \partial_y \overline{p} + \partial_y \phi''^\tau\right) + \partial_y \phi^{t^*}\left(\partial_\eta p'' - \mu_d''\right)^\tau\right] = R_V^{t^*} \quad (3.8)$$

Page 15, added map scale factors to pressure gradient terms, **pressure gradient now written as it appears in the ARW code and Klemp et al 2007:**

$$\begin{aligned} R_U^{t^*} = & - m_x \left[\partial_x(Uu) + \partial_y(Vu)\right] - \partial_\eta(\Omega u) \\ & - (m_x/m_y)(\alpha/\alpha_d)\left[\mu_d(\partial_x \phi' + \alpha_d \partial_x p' + \alpha'_d \partial_x \overline{p}) + \partial_x \phi(\partial_\eta p' - \mu'_d)\right] \quad (3.13) \\ R_V^{t^*} = & - m_y \left[\partial_x(Uv) + \partial_y(Vv)\right] - (m_y/m_x)\partial_\eta(\Omega v) \\ & - (m_y/m_x)(\alpha/\alpha_d)\left[\mu_d(\partial_y \phi' + \alpha_d \partial_y p' + \alpha'_d \partial_y \overline{p}) + \partial_y \phi(\partial_\eta p' - \mu'_d)\right] \quad (3.14) \end{aligned}$$

Page 19, added map scale factors to pressure gradient terms, reordered terms to better match Klemp et al 2007:

$$\begin{aligned} \partial_t U'' + (m_x/m_y)\overline{(\alpha^{t^*}/\alpha_d^{t^*})}^x & \left[\overline{\mu_d^{t^*}}^x\left(\overline{\alpha_d^{t^*}}^x \partial_x p''^\tau + \overline{\alpha_d''^\tau}^x \partial_x \overline{p} + \partial_x \overline{\phi''^\tau}^\eta\right)\right. \\ & \left. + \partial_x \overline{\phi^{t^*}}^\eta \left(\partial_\eta \overline{\overline{p''}^x}^\eta - \overline{\mu_d''}^x\right)^\tau\right] = R_U^{t^*} \quad (3.21) \\ \partial_t V'' + (m_y/m_x)\overline{(\alpha^{t^*}/\alpha_d^{t^*})}^y & \left[\overline{\mu_d^{t^*}}^y\left(\overline{\alpha_d^{t^*}}^y \partial_y p''^\tau + \overline{\alpha_d''^\tau}^y \partial_y \overline{p} + \partial_y \overline{\phi''^\tau}^\eta\right)\right. \\ & \left. + \partial_y \overline{\phi^{t^*}}^\eta \left(\partial_\eta \overline{\overline{p''}^y}^\eta - \overline{\mu_d''}^y\right)^\tau\right] = R_V^{t^*} \quad (3.22) \end{aligned}$$

Page 20, added map scale factors to pressure gradient terms, **pressure gradient now written as it appears in the ARW code and Klemp et al 2007:**

$$\begin{aligned} R_U^{t^*} = & -(m_x/m_y)\overline{(\alpha/\alpha_d)}^x \left[\overline{\mu_d}^x(\partial_x \overline{\phi'}^\eta + \overline{\alpha_d}^x \partial_x p' + \overline{\alpha'_d}^x \partial_x \overline{p}) + \partial_x \overline{\phi}^\eta(\partial_\eta \overline{\overline{p'}^x}^\eta - \overline{\mu'_d}^x)\right] \\ & + F_{U_{cor}} + \text{advection} + \text{mixing} + \text{physics}, \quad (3.29) \\ R_V^{t^*} = & -(m_y/m_x)\overline{(\alpha/\alpha_d)}^y \left[\overline{\mu_d}^y(\partial_y \overline{\phi'}^\eta + \overline{\alpha_d}^y \partial_y p' + \overline{\alpha'_d}^y \partial_y \overline{p}) + \partial_y \overline{\phi}^\eta(\partial_\eta \overline{\overline{p'}^y}^\eta - \overline{\mu'_d}^y)\right] \\ & + F_{V_{cor}} + \text{advection} + \text{mixing} + \text{physics}, \quad (3.30) \end{aligned}$$