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Corrigendum

Corrigendum to "Total electron content measurements in ionospheric physics" [Adv. Space Res. 42 (2008) 720–726]

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1. Corrections

In the derivation of the relative TEC calculation from the Doppler shift (Section 3), a factor of c, the speed of light and the phase ambiquity $m\lambda$ were inadvertently left out of the derivation. The correct derivation begins with

$$\frac{d\lambda\phi}{dt} - \lambda f_0 = \frac{d}{dt}(D + c(b - B + e + E + T - I) + m\lambda + v_\phi)$$

which reduces to

$$\lambda\delta f = \frac{c}{f}\delta f = v_{LOS} - c\frac{dI}{dt} + v_f \tag{8}$$

When differential downconverted Doppler shift is calculated, the downconverted frequencies was incorrected inserted, and the equation should read

$$\begin{aligned}\Delta\delta f_{DC} &= \frac{1}{8}\delta f_{UHF} - \frac{1}{3}\delta f_{VHF} \\ &= \left(\frac{f_{UHF}}{8c}v_{LOS} - \frac{f_{UHF}}{8}\frac{dI_{UHF}}{dt}\right) - \left(\frac{f_{VHF}}{3c}v_{LOS} - \frac{f_{VHF}}{3}\frac{dI_{VHF}}{dt}\right) \\ &\quad + v_f\end{aligned}$$

The derivation to Eq. (9) now becomes

$$\Delta\delta f_{DC} = \frac{e^2}{8\pi^2 c\epsilon_0 m_e}\frac{dSTEC}{dt}\left(\frac{1}{3f_{VHF}} - \frac{1}{8f_{UHF}}\right) + v_f$$

where the exponent of π has been corrected. Thus, Eq. (9) is

$$\begin{aligned}\frac{dSTEC}{dt} &= \frac{576 f_c}{55}\frac{8\pi^2 c\epsilon_0 m_e}{e^2}(\Delta\delta f_{DC} - v_f) \\ &\approx \frac{\Delta\delta f_{DC}}{2.569\times 10^{-16}[\mathrm{m}^2]}\end{aligned} \tag{9}$$

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