7.3 Surface Pressure Computation

1. first guess for representative T, p 100 hPa above surface

TER is height of ground elevation or ground model grid point height

$$P_{sfc} = P_{slv}\left(\frac{P_{slv}}{850}\right)^{-TER/H_{850}} \tag{7.1}$$

2. extrapolate Tslv

$$T_{slv} = T_{100-up}\left(\frac{P_{slv}}{P_{100-up}}\right)^{\gamma} \tag{7.2}$$

$$\gamma = \frac{ln\frac{T_{850}}{T_{700}}}{ln\frac{850}{700}}, \text{ if } 700 \le P_{100-up} \le 850 \tag{7.3}$$

3. corrected Tsfc

$$T_{sfc} = T_{slv} - \gamma_s \times \text{TER} \tag{7.4}$$

4. use mean temperature underground to estimate surface pressure

$$P_{sfc} = P_{slv} exp\left\{\frac{\text{-TER} \times g}{R} / \left[\frac{1}{2} \times (T_{sfc} + T_{slv})\right]\right\} \tag{7.5}$$