Advecting particles offline from the GOLD model output

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July 14, 2016

Positions are given in latitude and longitude and the PDEs for position are therefore,

$$\phi_t = \frac{u(\phi, \theta, t)}{R \cos\theta} \tag{1}$$

$$\theta_t = \frac{v(\phi, \theta, t)}{R} \tag{2}$$

which give us the integral equations,

$$\phi = \phi_0 + \int \left[\frac{u + U}{R \cos\theta(t)} \right] \, dt \tag{3}$$

$$\theta(t) = \theta_0 + \frac{1}{R} \int \left[v(t) + V(t) \right] \, dt \tag{4}$$

$$\tag{5}$$