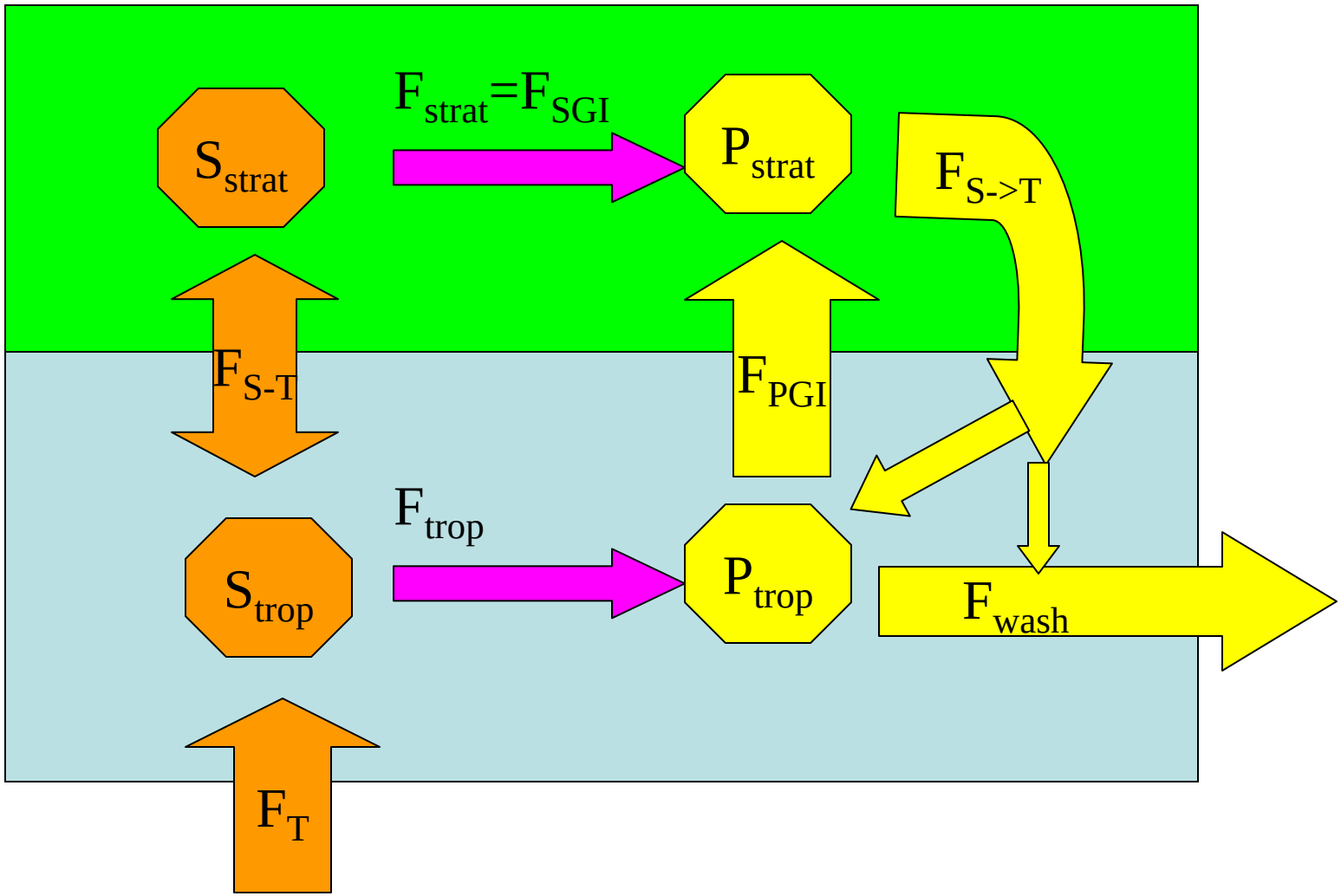
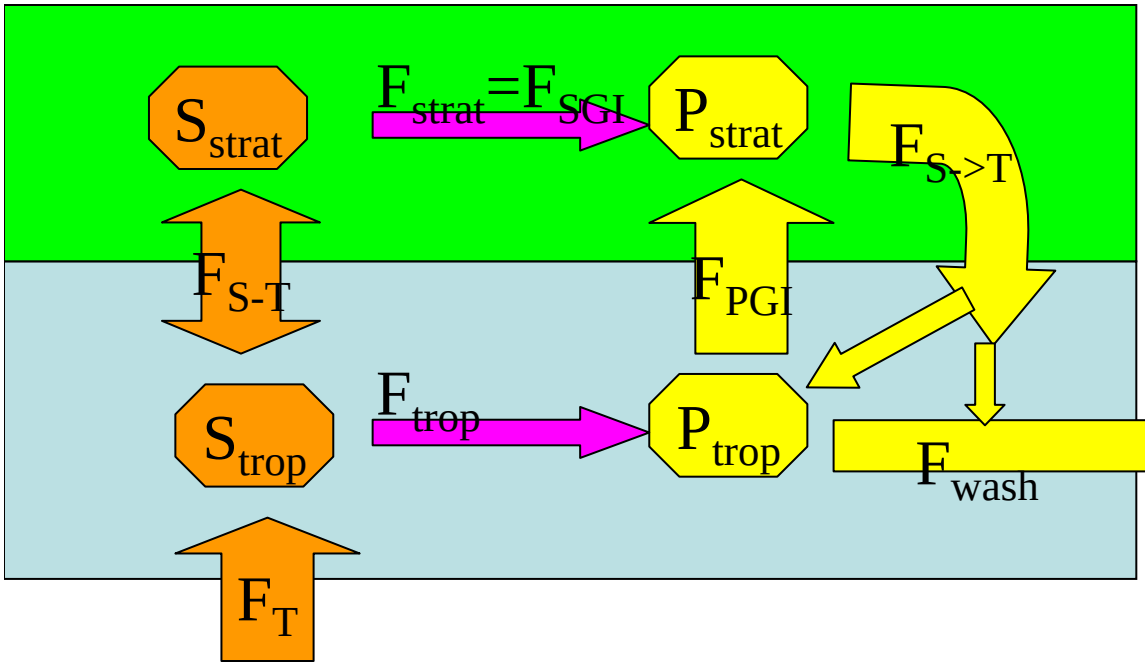
Estimating SGI and PGI fluxes





Useful for ODP estimates:

F_{SGI}/F_T; F_{PGI}/F_T

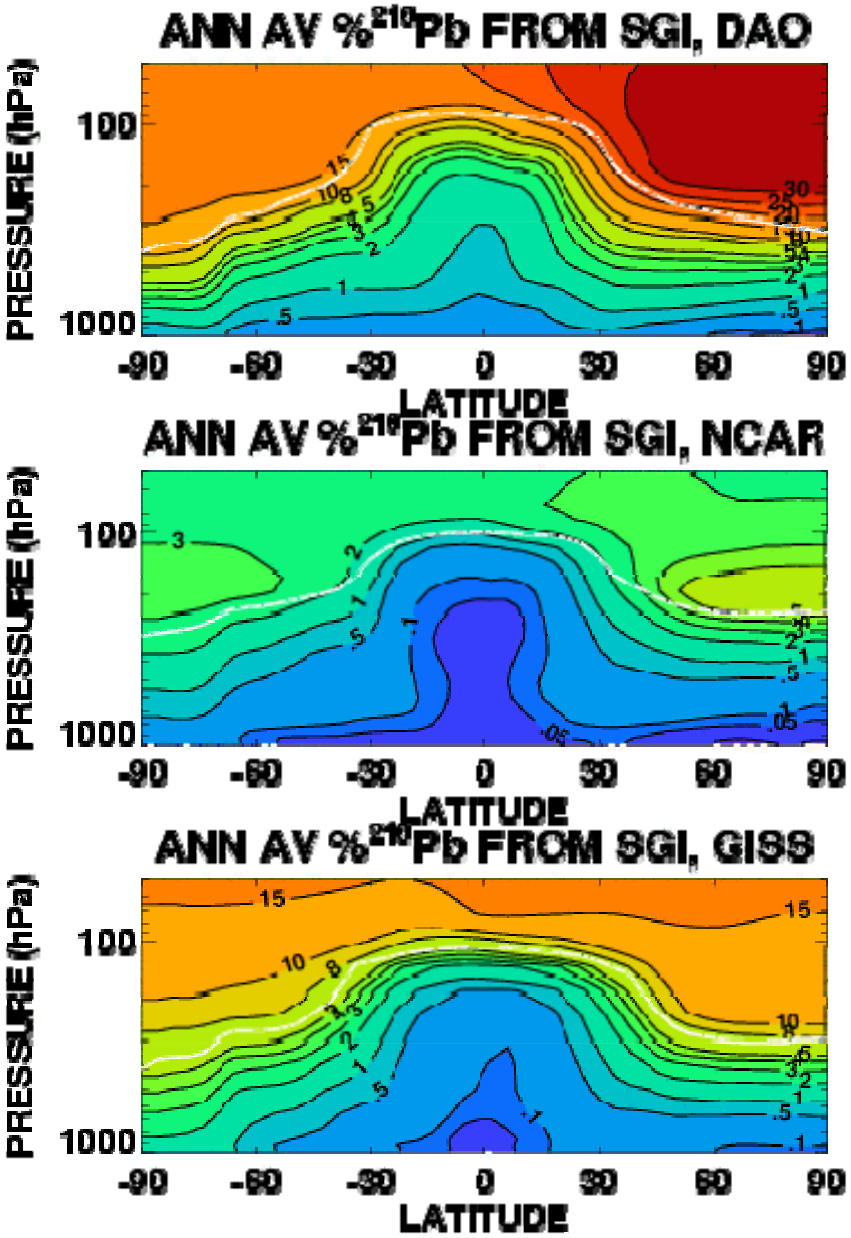
$$F_{SGI} = \iiint_{strat} [S] L_s dV$$

$$F_T = \iiint_{strat+trop} [S] L_s dV$$

Difficult to get F_{PGI} directly from model output

Alternative,

1. Perform second simulation to get $P`_{strat\text{-}SGI}$ by tagging product or assume instantaneous washout, residence time for $P`_{strat\text{-}SGI}$ is given by $P`_{strat\text{-}SGI} / F_{SGI}$
2. Assume $P_{strat\text{-}PGI} = P_{strat} - P`_{strat\text{-}SGI}$
3. Assume same residence time for $P`_{strat\text{-}SGI}$ and $P_{strat\text{-}PGI}$
4. Then, $F_{PGI} = F_{SGI} * (P_{strat\text{-}PGI} / P`_{strat\text{-}SGI})$



Considine et al. (ACP, 2005)

- GMI model with 3 met fields
- Use radon (^{222}Rn, half life 3.8 days) and lead (^{210}Pb, half-life 22 years, removed by attaching to aerosols and scavenging), get SGI by tagging product
- Uniform emissions from non-frozen land surfaces. Much smaller emissions over water (5×10^{-3} smaller)
- Plotted is % $P`_{strat\text{-}SGI}/P_{strat}$
- Proxy for Iodine?

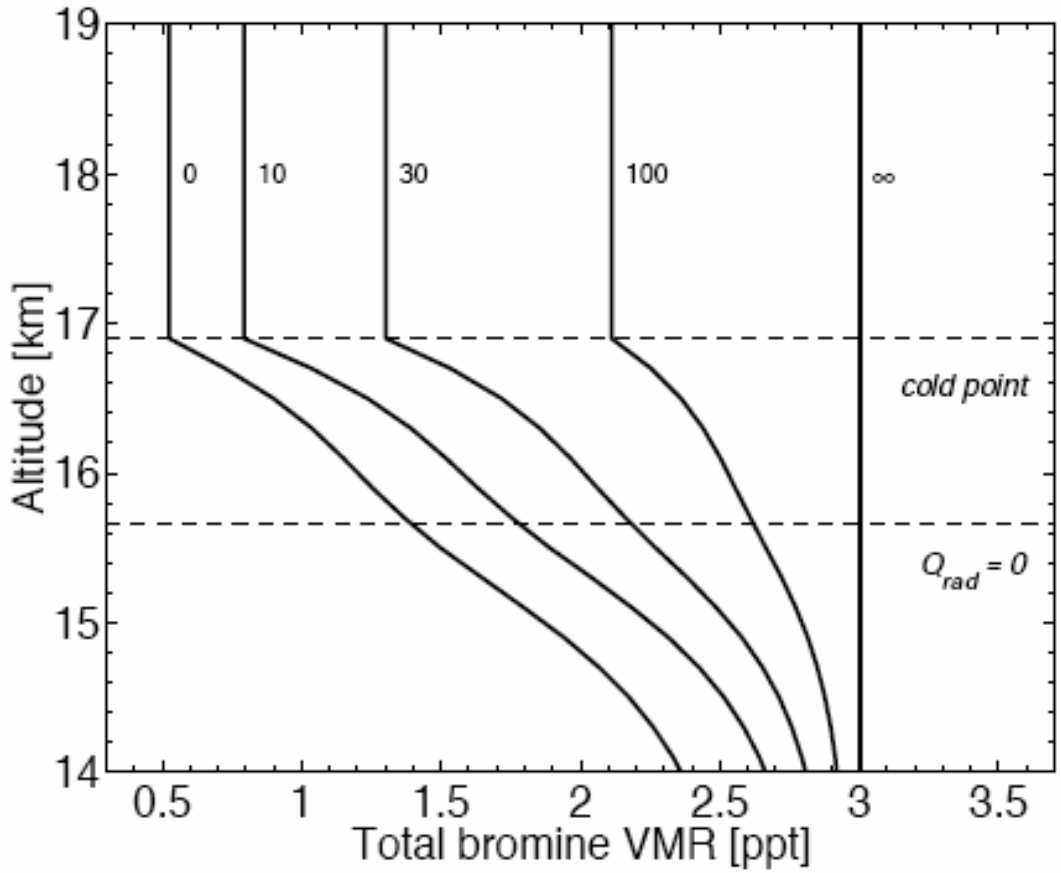


Fig. 5. Calculated total bromine released from bromoform (defined as $Br_y + 3 \times CHBr_3$) for different loss rates of Br_y (numbers given in the graph with Br_y lifetime in days). The calculations assume 1 pptv of bromoform in the boundary layer and no detrainment of Br_y from convection (see text for discussion).

Sinnhuber and Folkins
ACPD, 2005

- Mechanistic model
- CHBr3, fast washout to get SGI