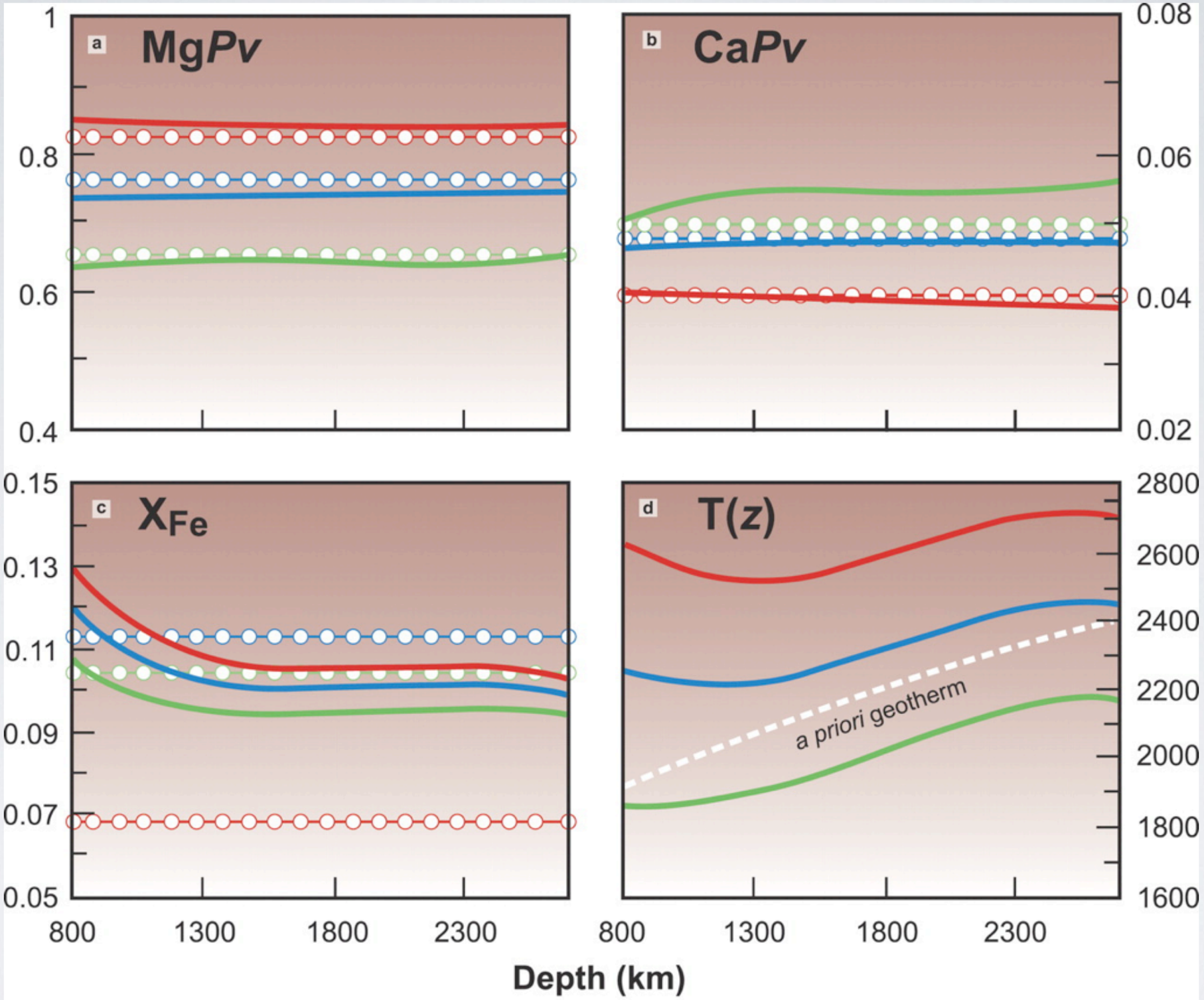

FIGURE 4 Lower-mantle compositions (IM1 to IM3) obtained from different *a priori* compositional models (pyrolite, CI chondrite, cosmic) and geotherm (dashed line in d). Phase molar fraction for magnesium-rich silicate perovskite and calcium silicate perovskite are given in (**A**) and (**B**). Temperature is in kelvin. Green circles: *a priori* pyrolite composition and associated inverted model IM1 (solid green line); blue circles: *a priori* CI-chondritic composition and associated inverted model IM2 (solid blue line); red circles:*a priori* cosmic composition and associated inverted model IM3 (solid red line). Iron content X_{Fe} (**C**) and temperature (**D**) are the most sensitive parameters, whereas the magnesium silicate perovskite (**A**) and calcium silicate perovskite (**B**) contents remain close to their *a priori* values. There is a strong positive trade-off between the magnesium silicate perovskite content and temperature. The seismic density and bulk sound velocity profiles can be explained either by a `cold' (i.e. 2000 K) pyrolite-like lower mantle (Mg*Pv* 0.64) or by a `hot' (i.e. 2600 K) perovskitic lower mantle (Mg*Pv* 0.84). See Mattern et al. 2005 and references therein for more details.