



FIGURE 6 Cartoon scenario for the D'' region. The D'' seismic discontinuity is caused by the perovskite (Pv) to post-perovskite (PPv) phase transition. Post-perovskite may transform back to perovskite in the bottom thermal boundary layer with a steep temperature gradient. The large low-shear-velocity provinces (LLSVP) underneath upwellings (forming plumes) possibly represent large accumulations of dense MORB-enriched materials. The solid residue formed by partial melting in the ULVZ might also be involved in upwelling plumes.