Movie 3：Instantaneous flow structures visualized by volume rendering of temperature anomaly for , *Ra* = 109, Pr=4.38, and , corresponding to figure 1(*c*, *f*). The action of vertical vibration attenuates the intensity of buoyancy-driven convection and stabilizes thermal boundary layer, thereby prevents thermal plumes from fragmenting by turbulent fluctuations and suppresses the plume emission. With increasing the frequency, the eruption of thermal plumes and the plume fragmentation are more significantly suppressed.