Supplementary material

Fig. S1 The correlation between energy and temperature of Ni$_{35}$Zr$_{65}$, Ni$_{50}$Zr$_{50}$ and Ni$_{65}$Zr$_{35}$ alloy upon rapidly quenching with the cooling rate of $10^{13}$ K/s. One notes that the glass transition temperature $T_g$ of Ni$_{35}$Zr$_{65}$, Ni$_{50}$Zr$_{50}$ and Ni$_{65}$Zr$_{35}$ alloy are about 1000 K, 1100 K and 1200 K, respectively. In addition, all the alloy melts were first equilibrated at 2000 K for 200 ps, to reach relatively stable states at which the related dynamic variables show no secular variation, and then rapidly quenched down to the room temperature, obtaining the metallic glasses.
Fig. S2 The fraction of activating atoms $p(d \geq d')$ as a function of temperature $T$ for Ni$_{35}$Zr$_{65}$, Ni$_{50}$Zr$_{50}$ and Ni$_{65}$Zr$_{35}$ alloys, respectively.
Fig. S3 The fraction of the activating atoms in Ni$_{65}$Zr$_{35}$ alloy with different frequency sinusoidal strain. It is shown that the maturating temperature correlates to the applying sinusoidal strain with frequencies.