Description of Additional Supplementary Files

**Supplementary Movie 1** Reversible deformation of an Au bicrystal containing a 13.5° [110] LAGB. The GB migration was mediated by the collective motion of dissociated GB dislocations. The movie was speeded up by 5 times.

**Supplementary Movie 2** Reversible migration of a 13.5° [110] LAGB in Au bicrystal reproduced in MD simulation at 300 K under the shear velocity of 1 m s\(^{-1}\).

**Supplementary Movie 3** Real-time stress-strain curve corresponding to the reversible migration of the 13.5° [110] LAGB in an Au bicrystal during shear loading cycle.

**Supplementary Movie 4** Long-term reversible deformation of an Au bicrystal for 500 cycles in MD simulation.

**Supplementary Movie 5** Reversible deformation of an Au bicrystal consisting a 18° [110] GB under different strain rates. The movie was speeded up by 5 times for deformations under the strain rates of 0.006 s\(^{-1}\) and 0.06 s\(^{-1}\).