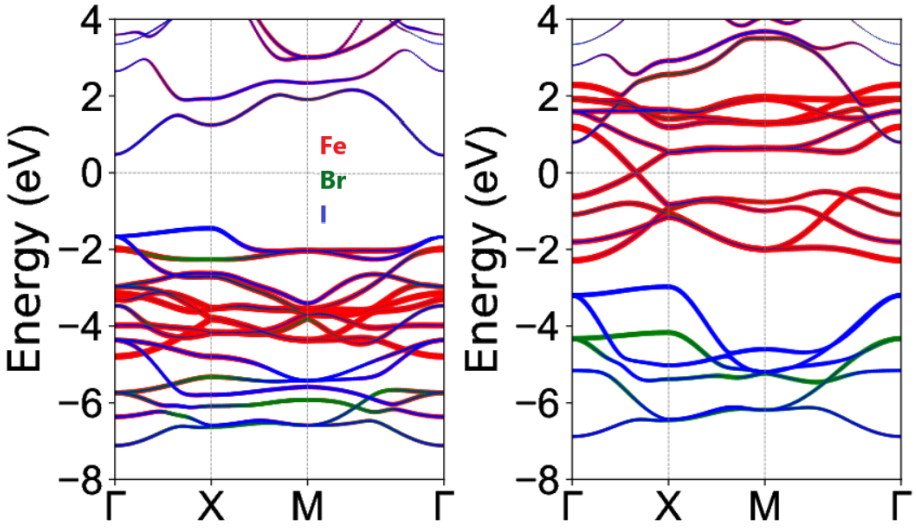

FIG. 1. (Color online) For unstrained Fe_2IBr monolayer, the element (Fe, Br and I) character of the spin-up (Left) and spin-dn (Right) using GGA.

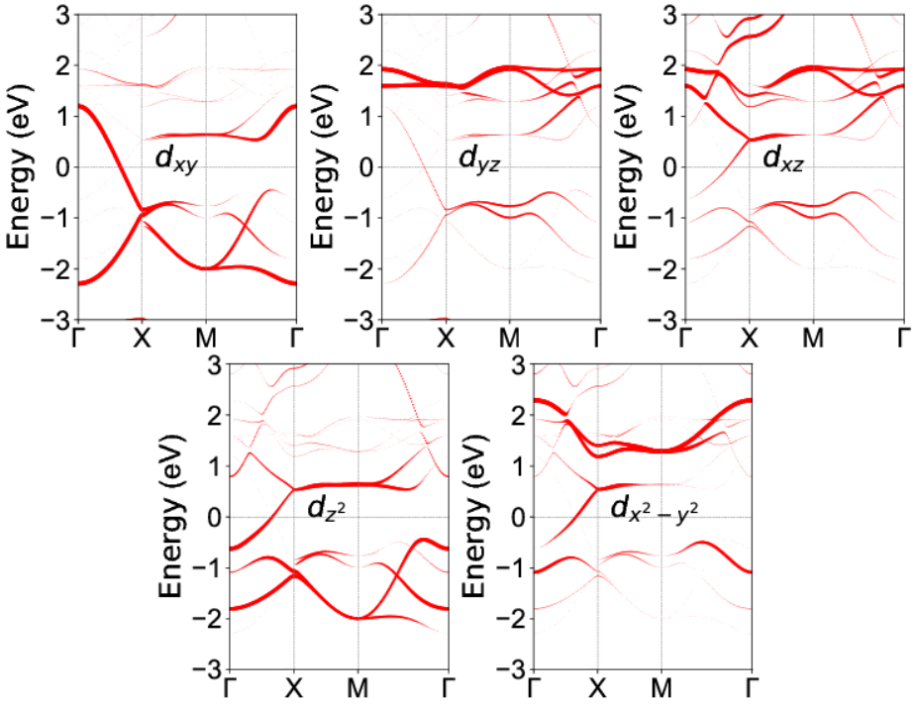

FIG. 2. (Color online)For unstrained Fe_2IBr monolayer, the *d*-orbital character of the minority-spin bands for Fe using GGA.

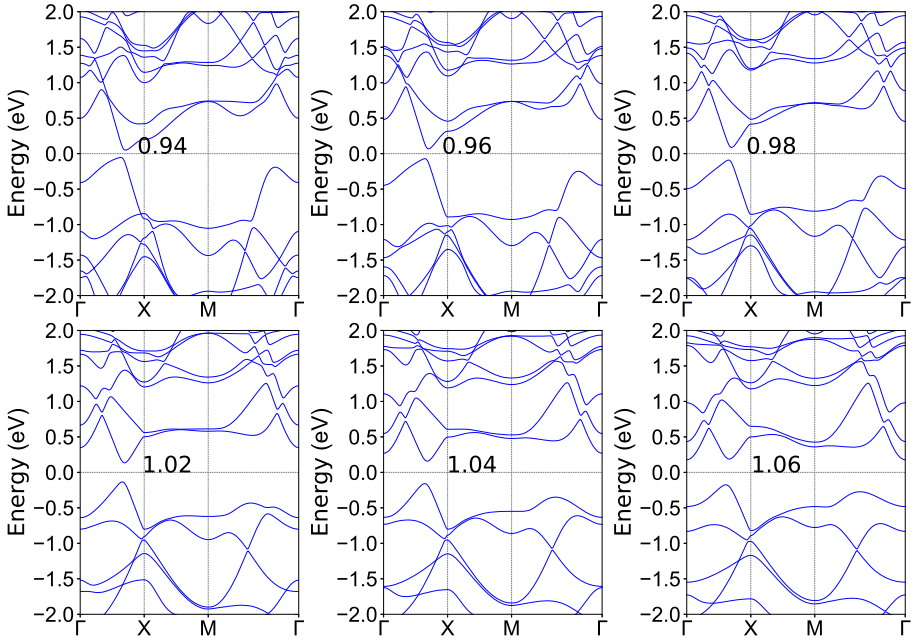

FIG. 3. (Color online) The energy band structures of Fe_2ICl monolayer using GGA+SOC with a/a_0 changing from 0.94 to 1.06.

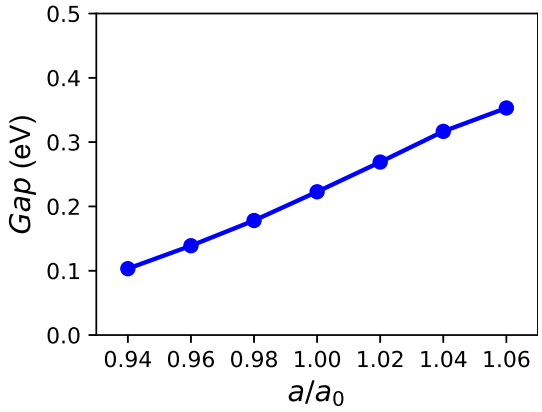

FIG. 4. (Color online) For monolayer Fe_2ICl, the gap with the application of biaxial strain (0.94 to 1.06) using GGA+SOC.

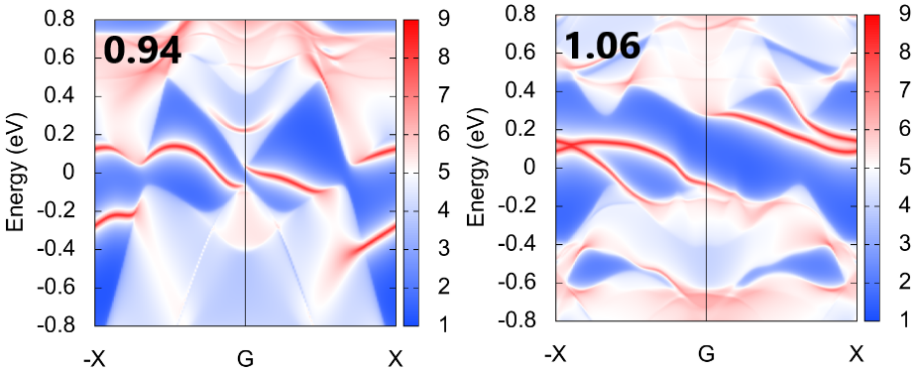

FIG. 5. (Color online) Topological edge states of Fe_2ICl calculated along the (100) direction at 0.94 and 1.06 strains.

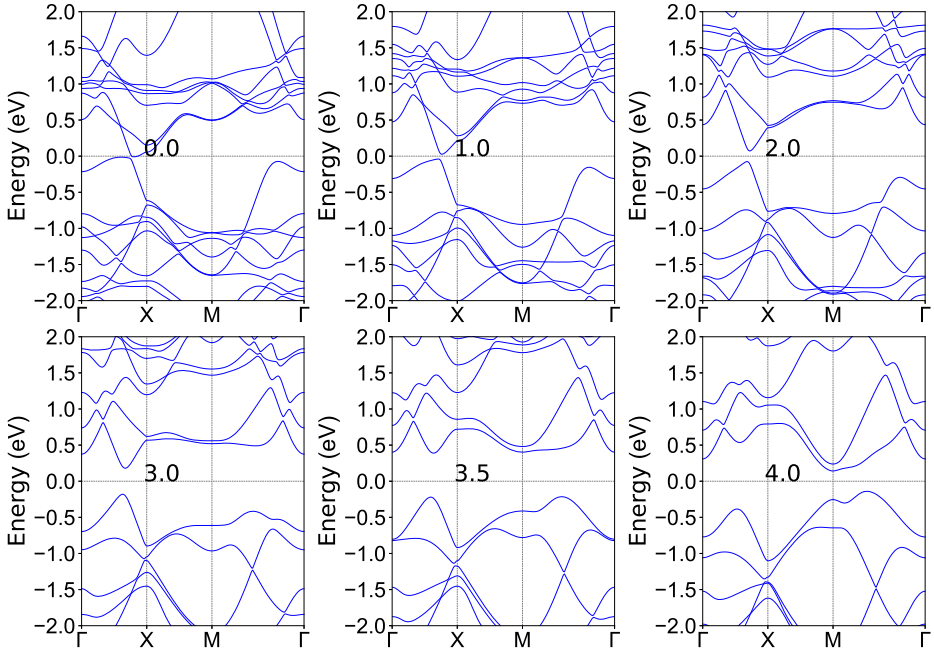

FIG. 6. (Color online) The energy band structures of Fe_2ICl monolayer using GGA+SOC with six different U values (0.0, 1.0, 2.0, 3.0, 3.5 and 4.0 eV).

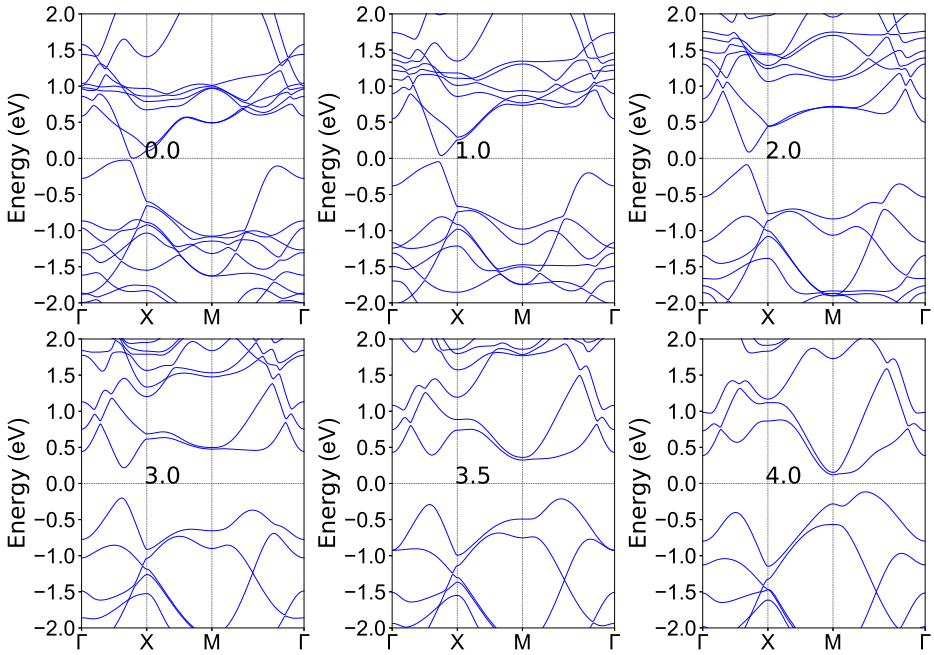

FIG. 7. (Color online) The energy band structures of Fe_2IBr monolayer using GGA+SOC with six different U values (0.0, 1.0, 2.0, 3.0, 3.5 and 4.0 eV).

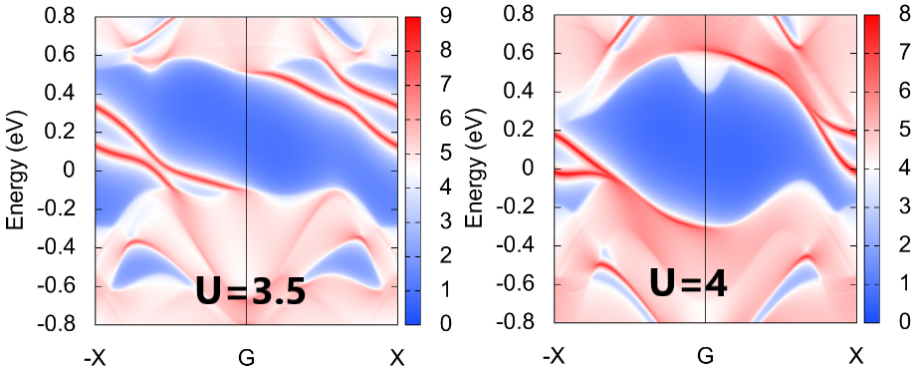

FIG. 8. (Color online) Topological edge states of Fe_2ICl calculated along the (100) direction at U=3.5 eV and U=4.0 eV.