

## **Description of Additional Supplementary Files**

### **Supplementary Movie 1**

The evolution of (001) stacking fault with fault vector of  $b/6[110]$   $\text{Li}_2\text{MnO}_3$  in delithiation observed by in-situ HREM. The frame speed is 64 X faster than real time.

### **Supplementary Movie 2**

In  $\text{Li}_2\text{MnO}_3$  delithiation, dissociated dislocations with Burgers vector of  $c/2[001]$  formed. The frame speed is 2 X faster than real time.

### **Supplementary Movie 3**

*In-situ* HREM of  $\text{Li}_2\text{MnO}_3$  in lithiation showing the generation and climbing of the dislocations with Burgers vector of  $c/2[001]$ . The frame speed is 8 X faster than real time.

### **Supplementary Movie 4**

*In-situ* HREM of  $\text{Li}_2\text{MnO}_3$  in lithiation showing the gliding and climbing of the dislocations with Burgers vector of  $c/2[001]$ . The frame speed is 2 X faster than real time.