

Figure 1. The hardness HV of joints versus the distribution: (a) Al-Al RFSSW joint, and (b) Al-steel RFSSW joint, and the high cycle fatigue performance at R=0: (c) fatigue life versus stress amplitude ( $\Delta\sigma$ ) and (d) fatigue life versus  $\Delta\sigma/\sigma_b$ .

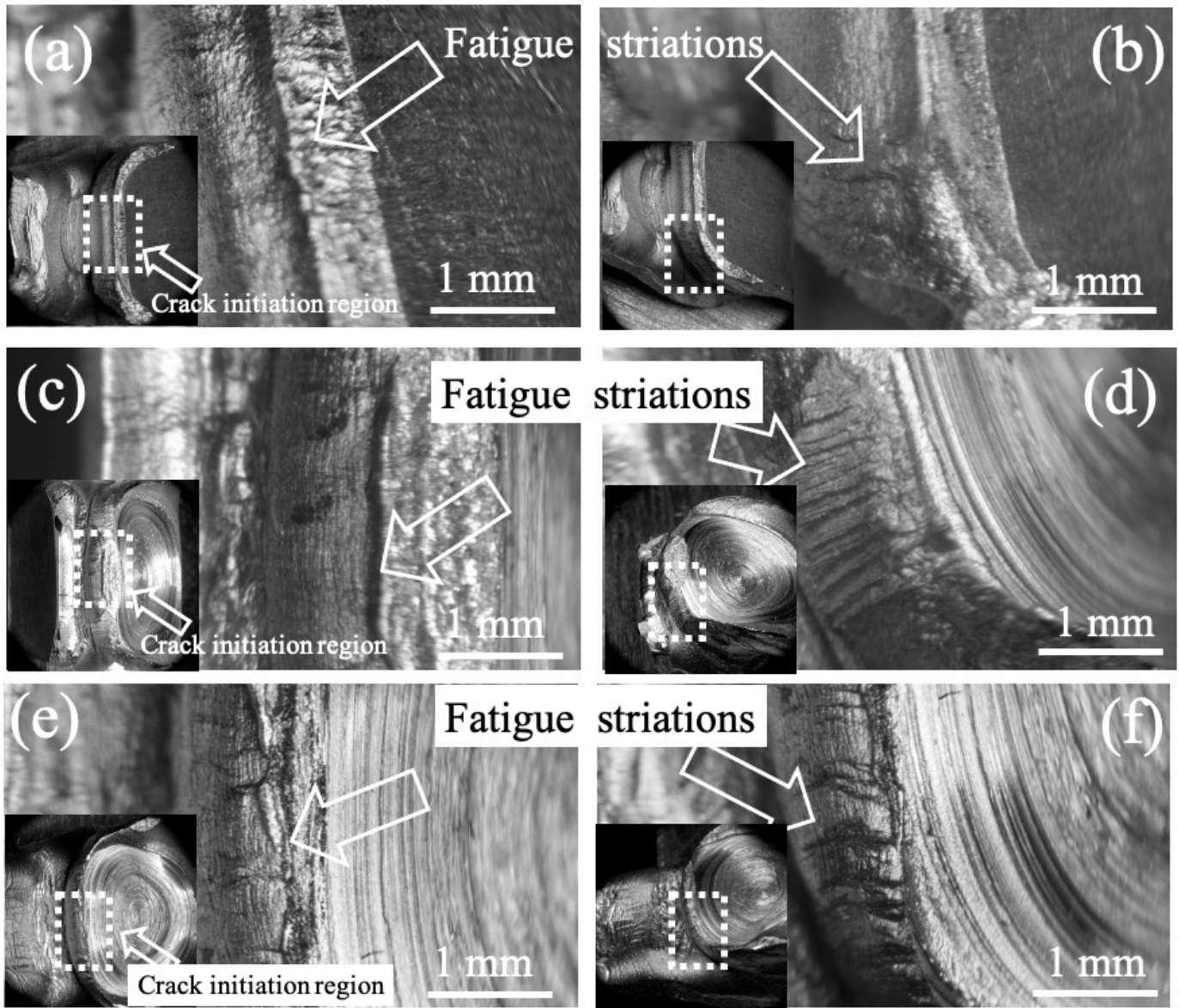


Figure 2. The detailed observation of Al-Al RFSSW joint fatigue fracture with  $\Delta\sigma/\sigma_b=0.2$  (a&b),  $\Delta\sigma/\sigma_b=0.3$  (c&d),  $\Delta\sigma/\sigma_b=0.4$  (e&f). The macro image of the fractured joint is inserted in each figure, respectively.

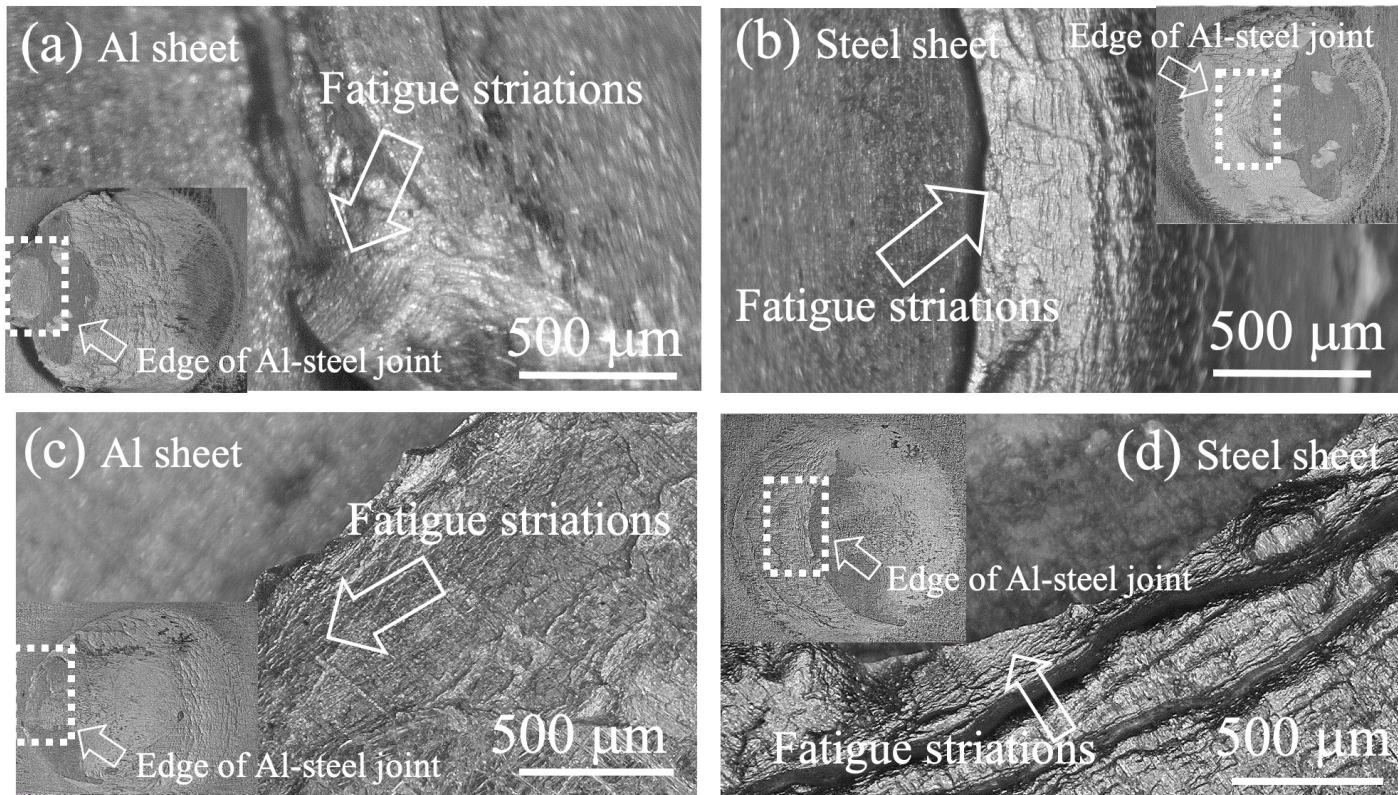


Figure 3. The detailed observation of Al-steel RFSSW joint fatigue fracture with  $\Delta\sigma/\sigma_b=0.3$  (a&b) and  $\Delta\sigma/\sigma_b=0.4$  (c&d). The macro image of the fractured joint and the crack initiation region (white dotted box) are inserted in each figure, respectively.