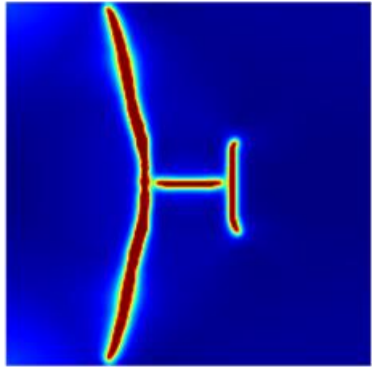


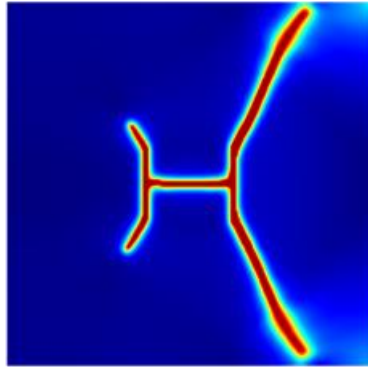


HF-NF interactions

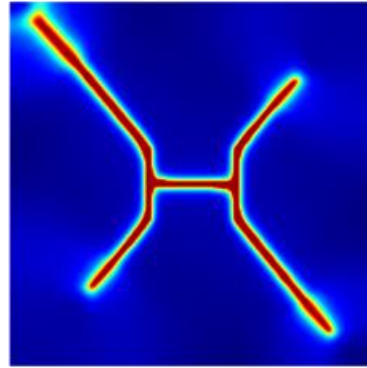
➤ stress condition



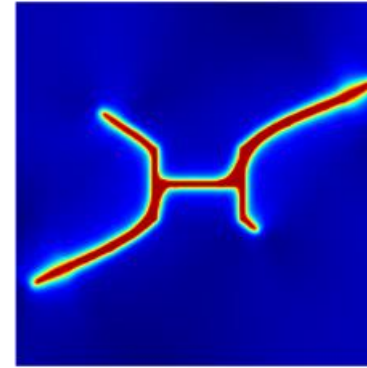
$$\sigma_x / \sigma_y = 0.3$$



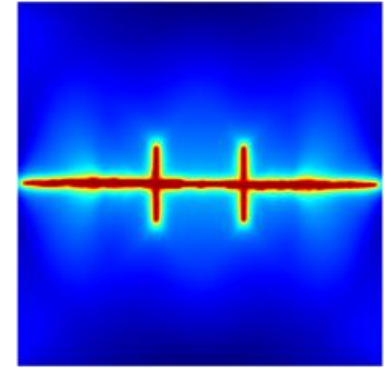
$$\sigma_x / \sigma_y = 0.5$$



$$\sigma_x / \sigma_y = 1.0$$



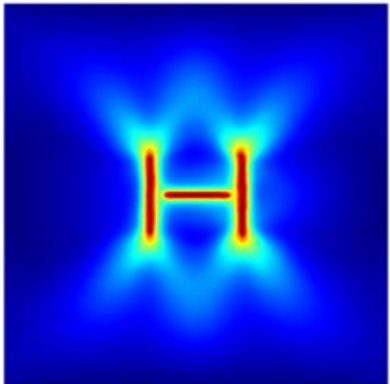
$$\sigma_x / \sigma_y = 2.0$$



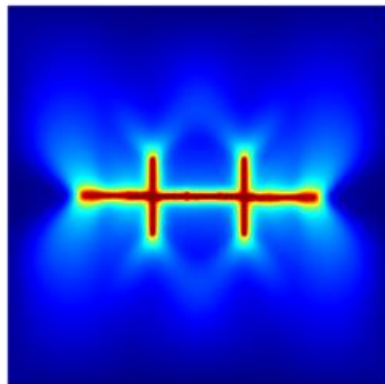
$$\sigma_x / \sigma_y = 5.0$$



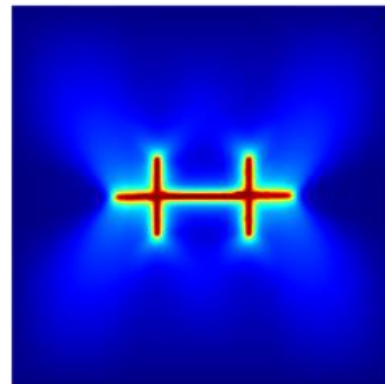
➤ Injection rate



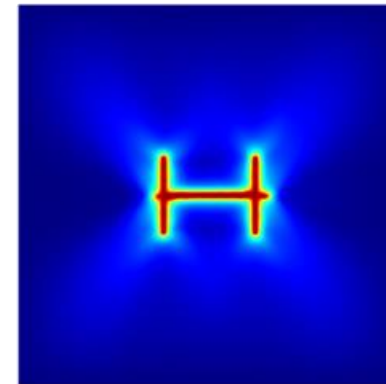
$$q_f = 2 \text{ kg}/(\text{m}^3 \cdot \text{s})$$



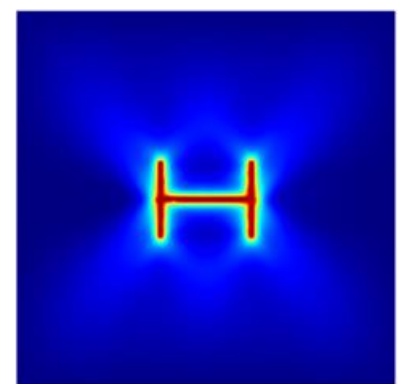
$$q_f = 5 \text{ kg}/(\text{m}^3 \cdot \text{s})$$



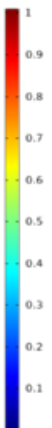
$$q_f = 10 \text{ kg}/(\text{m}^3 \cdot \text{s})$$



$$q_f = 15 \text{ kg}/(\text{m}^3 \cdot \text{s})$$

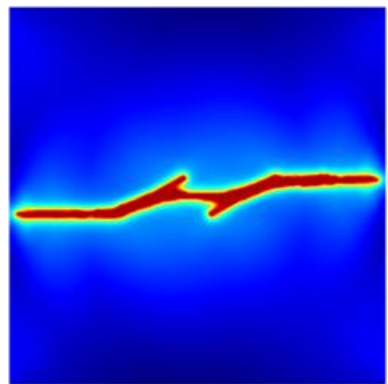


$$q_f = 20 \text{ kg}/(\text{m}^3 \cdot \text{s})$$

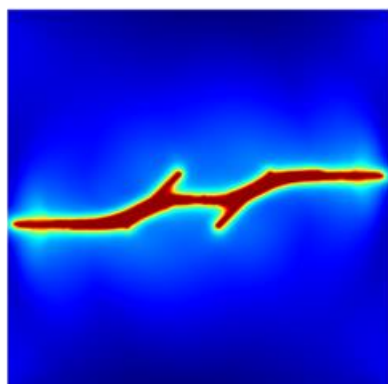


HF-NF interactions

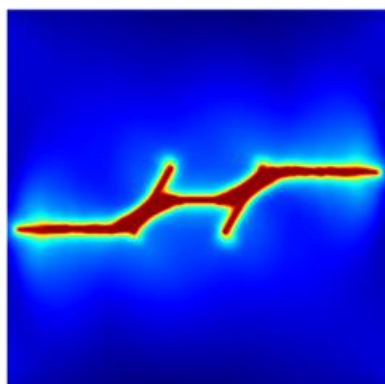
➤ Approaching angle



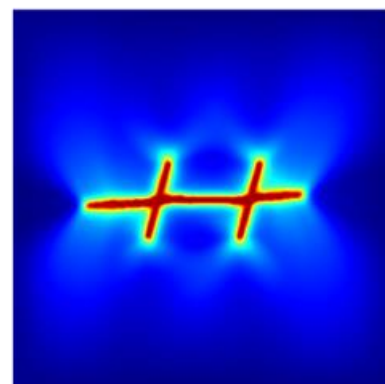
$\theta=30^\circ$



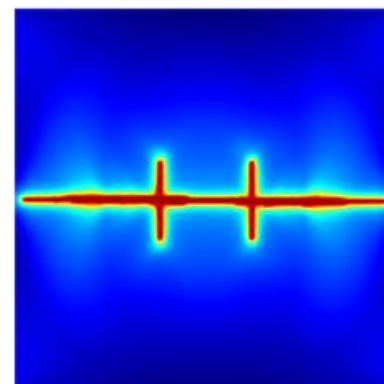
$\theta=45^\circ$



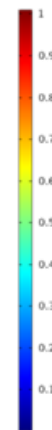
$\theta=60^\circ$



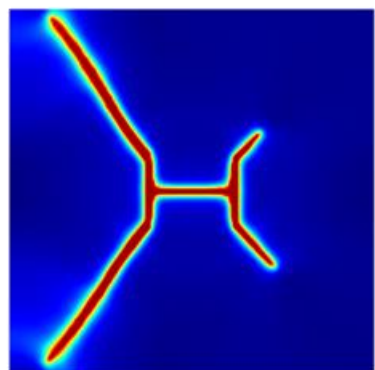
$\theta=75^\circ$



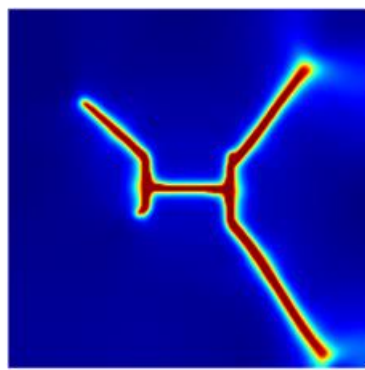
$\theta=90^\circ$



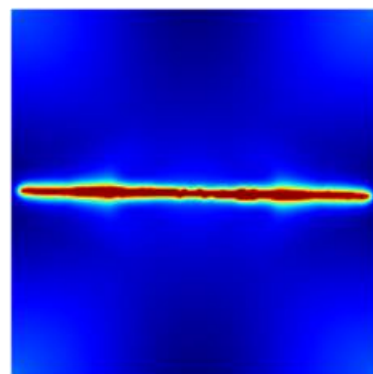
➤ G_c value



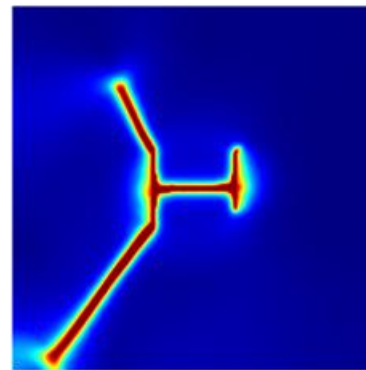
$G_c^{\text{int}} / G_c^{\text{bulk}} = 0.2$



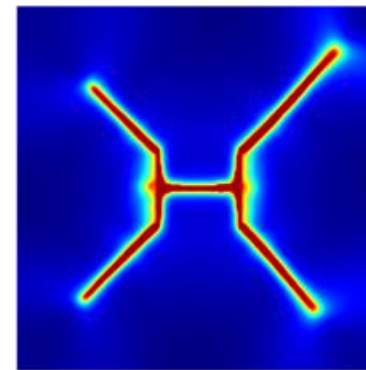
$G_c^{\text{int}} / G_c^{\text{bulk}} = 0.5$



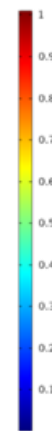
$G_c^{\text{int}} / G_c^{\text{bulk}} = 1.0$



$G_c^{\text{int}} / G_c^{\text{bulk}} = 1.5$



$G_c^{\text{int}} / G_c^{\text{bulk}} = 2.0$





HF-NF interactions

➤ G_c value

