

Fig. 4.48 Velocity vectors on the cross plane  $\theta = 0^\circ$  &  $180^\circ$  at certain time instants in steady or statistical state for  $H = 10.0$  &  $15.0$  mm for  $D_j = 10.0$  mm,  $Re_j = 406$  ( $Q_j = 3.0$  slpm) for  $\Delta T =$  (a)  $5.0^\circ\text{C}$ , (b)  $10.0^\circ\text{C}$ , and (c)  $25.0^\circ\text{C}$ .

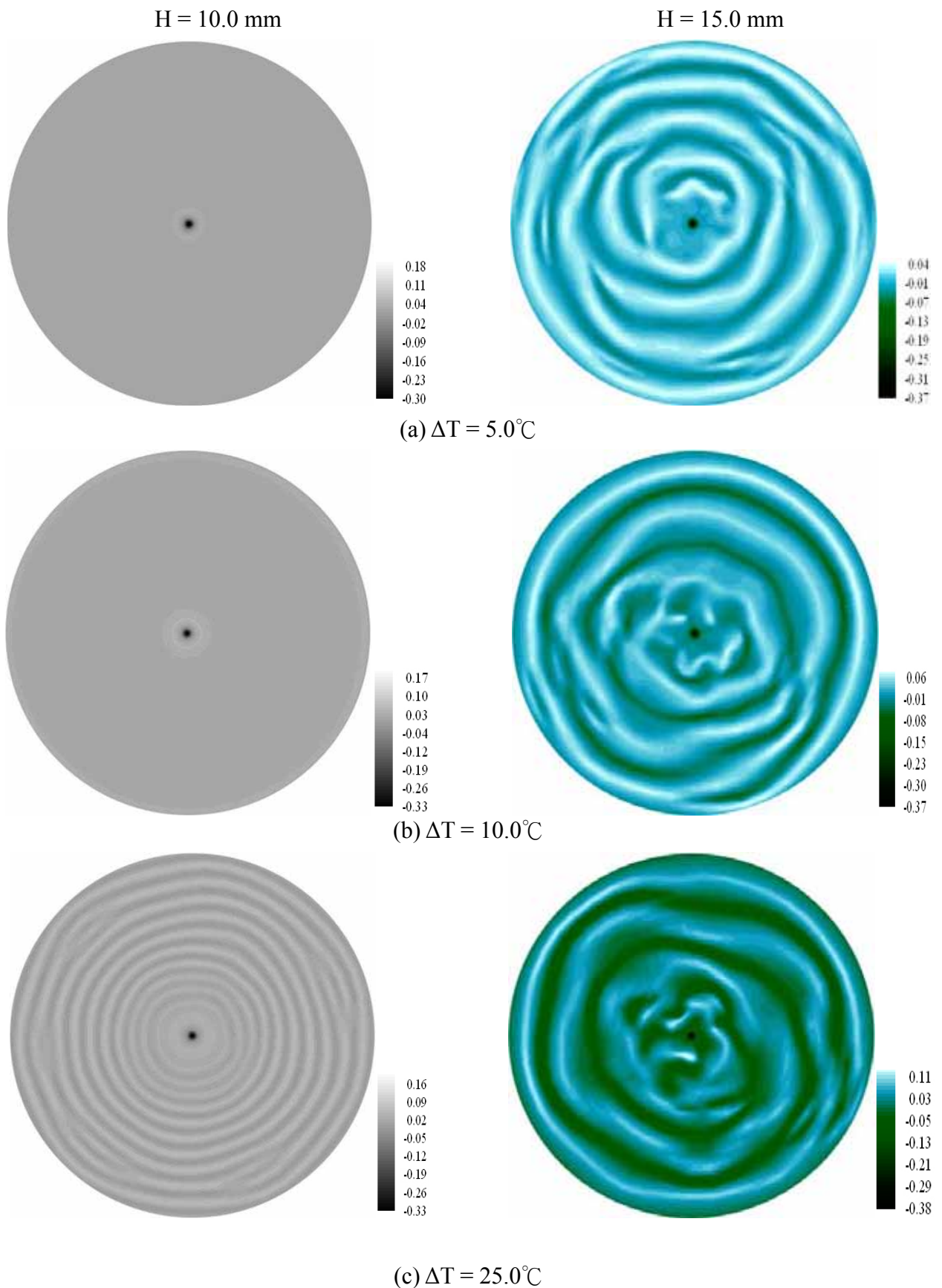


Fig. 4.49 Contours of vertical velocity component  $w$  at the middle horizontal planes at certain time instants in steady or statistical state for  $H = 10.0$  &  $15.0 \text{ mm}$  for  $D_j = 10.0 \text{ mm}$ ,  $Re_j = 135$  ( $Q_j = 1.0 \text{ slpm}$ ) for  $\Delta T =$  (a)  $5.0^\circ\text{C}$ , (b)  $10.0^\circ\text{C}$ , and (c)  $25.0^\circ\text{C}$ .

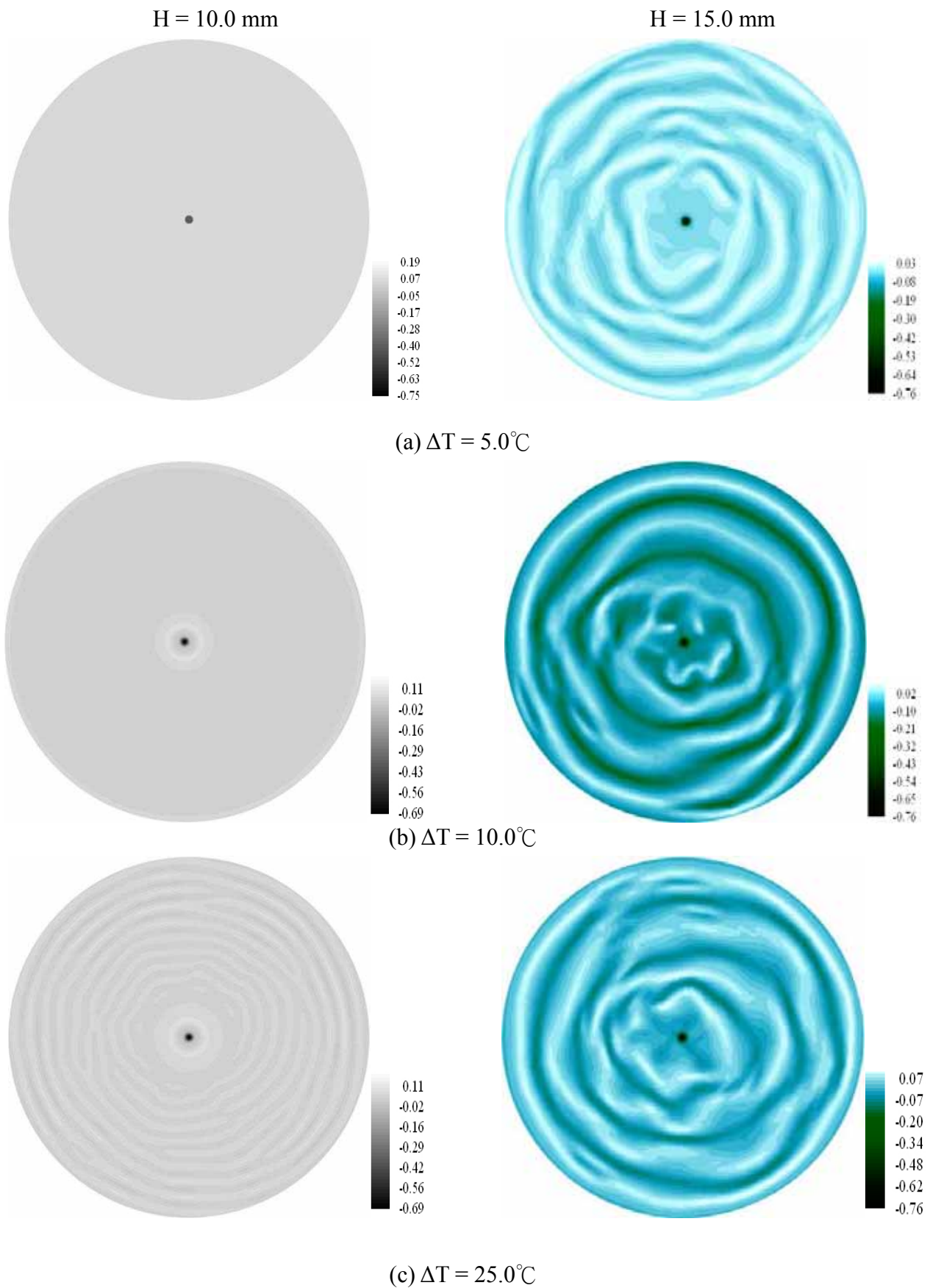


Fig. 4.50 Contours of vertical velocity component  $w$  at the middle horizontal planes at certain time instants in steady or statistical state for  $H = 10.0$  &  $15.0 \text{ mm}$  for  $D_j = 10.0 \text{ mm}$ ,  $Re_j = 270$  ( $Q_j = 2.0 \text{ slpm}$ ) for  $\Delta T =$  (a)  $5.0^\circ\text{C}$ , (b)  $10.0^\circ\text{C}$ , and (c)  $25.0^\circ\text{C}$ .

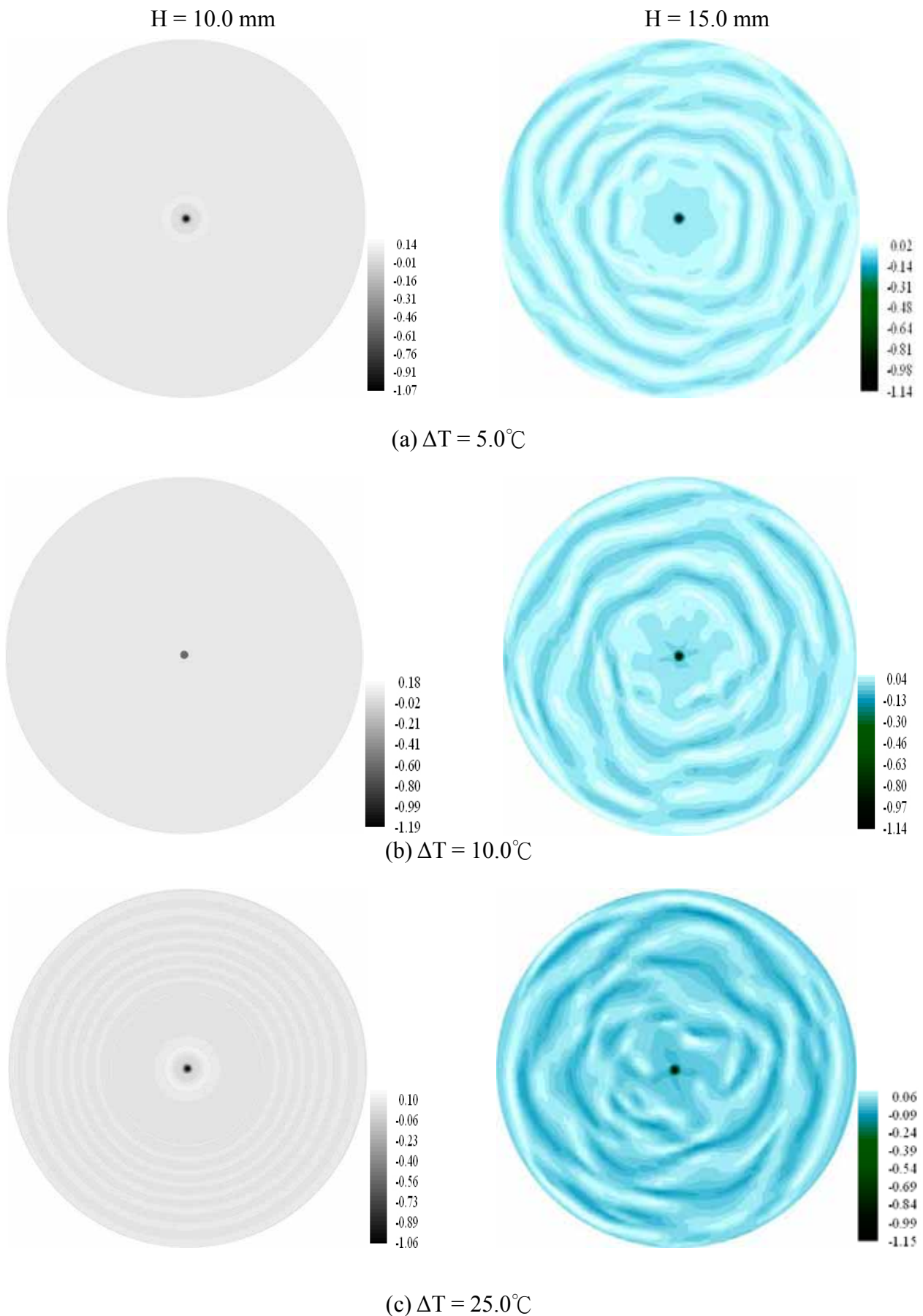


Fig. 4.51 Contours of vertical velocity component  $w$  at the middle horizontal planes at certain time instants in steady or statistical state for  $H = 10.0$  &  $15.0 \text{ mm}$  for  $D_j = 10.0 \text{ mm}$ ,  $Re_j = 406$  ( $Q_j = 3.0 \text{ slpm}$ ) for  $\Delta T =$  (a)  $5.0^\circ\text{C}$ , (b)  $10.0^\circ\text{C}$ , and (c)  $25.0^\circ\text{C}$ .

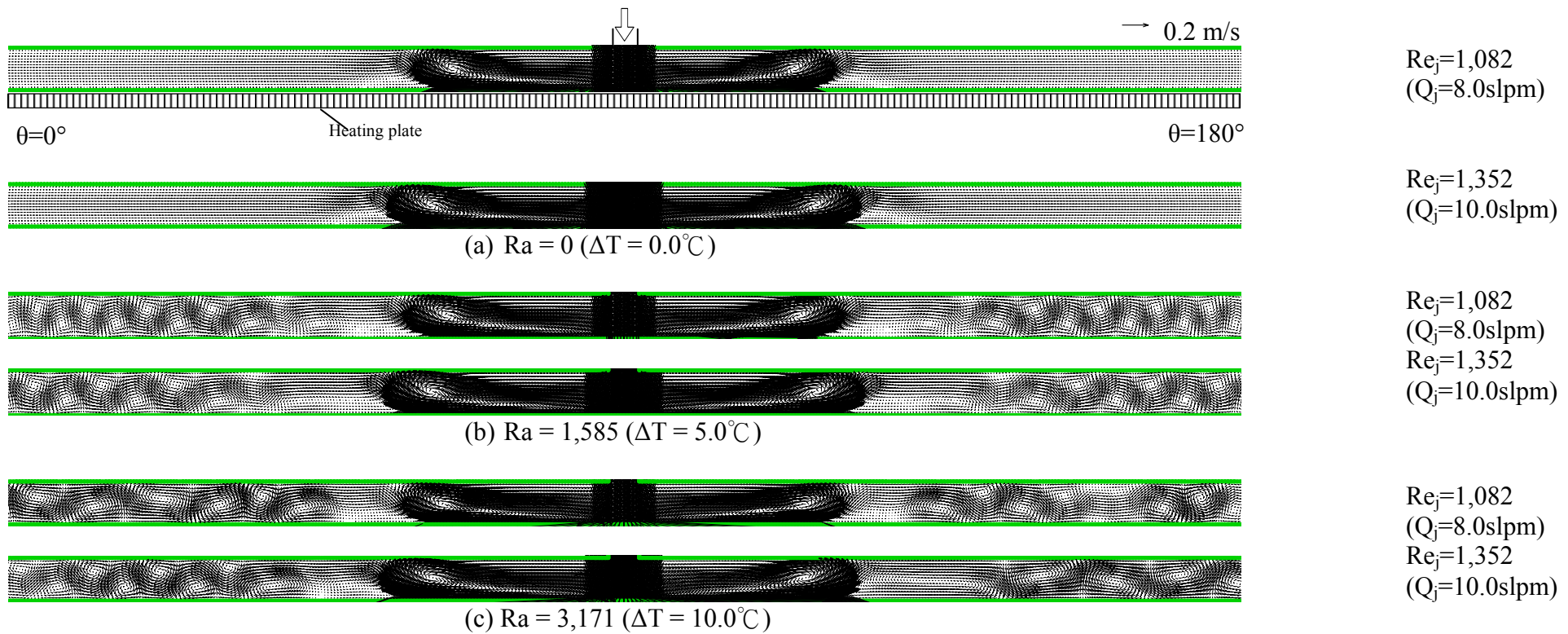


Fig. 4.52 Velocity vectors on the cross plane  $\theta = 0^\circ$  &  $180^\circ$  at certain time instants in steady or statistical state for  $Re_j = 1,082$  ( $Q_j = 8.0\text{slpm}$ ) &  $1,352$  ( $Q_j = 10.0\text{slpm}$ ) for  $D_j = 10.0$  mm,  $H = 15.0$  mm for  $Ra =$  (a)  $0$  ( $\Delta T = 0^\circ\text{C}$ ), (b)  $1,585$  ( $\Delta T = 5.0^\circ\text{C}$ ), (c)  $3,171$  ( $\Delta T = 10.0^\circ\text{C}$ ), (d)  $4,756$  ( $\Delta T = 15.0^\circ\text{C}$ ), (e)  $9,513$  ( $\Delta T = 30.0^\circ\text{C}$ ), and (f)  $12,684$  ( $\Delta T = 40.0^\circ\text{C}$ ).

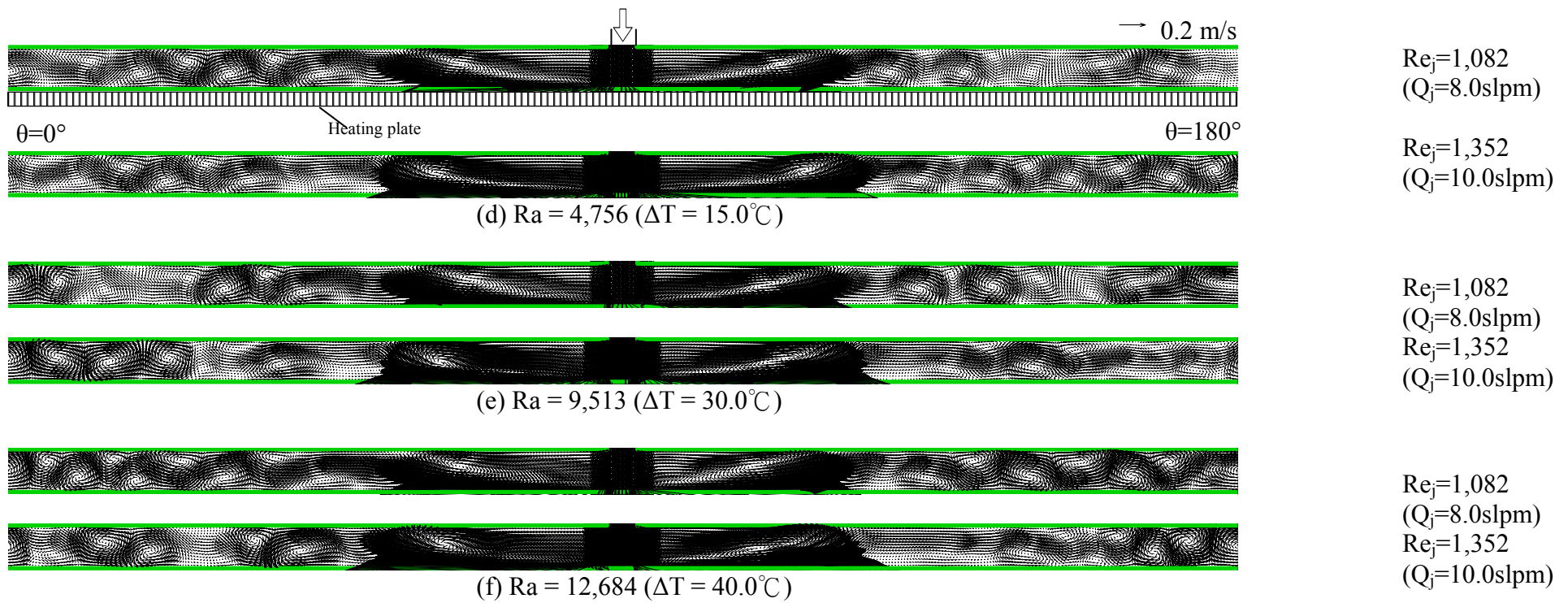


Fig. 4.52 Continued.

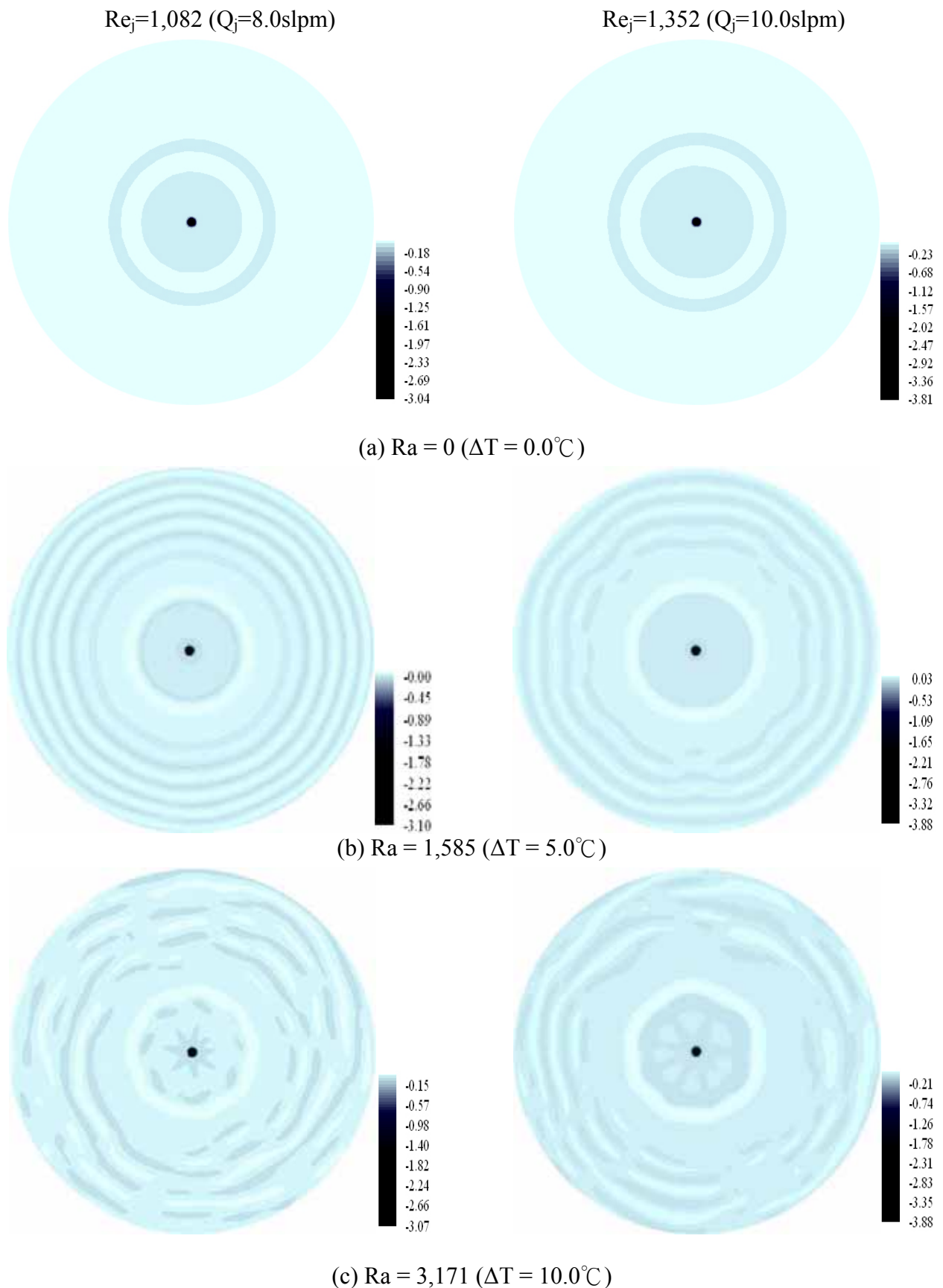


Fig. 4.53 Contours of vertical velocity component  $w$  at the middle horizontal planes at certain time instants in steady or statistical state for  $Re_j = 1,082$  ( $Q_j = 8.0\text{slpm}$ ) &  $1,352$  ( $Q_j = 10.0\text{slpm}$ ) for  $D_j = 10.0$  mm,  $H = 15.0$  mm for  $Ra =$  (a)  $0$  ( $\Delta T = 0.0^\circ\text{C}$ ), (b)  $1,585$  ( $\Delta T = 5.0^\circ\text{C}$ ), (c)  $3,171$  ( $\Delta T = 10.0^\circ\text{C}$ ), (d)  $4,756$  ( $\Delta T = 15.0^\circ\text{C}$ ), (e)  $9,513$  ( $\Delta T = 30.0^\circ\text{C}$ ), and (f)  $12,684$  ( $\Delta T = 40.0^\circ\text{C}$ ).

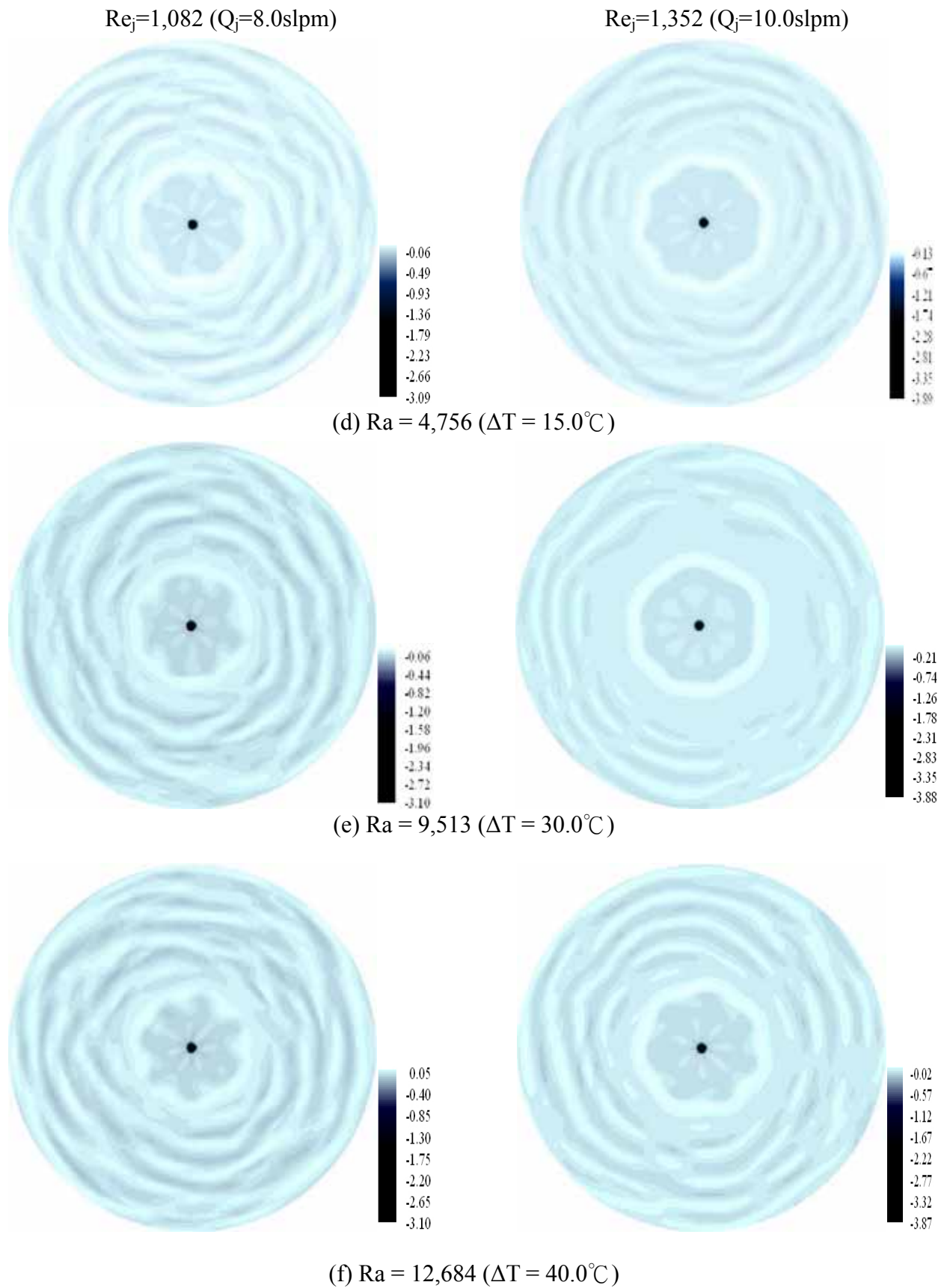


Fig. 4.53 Continued.



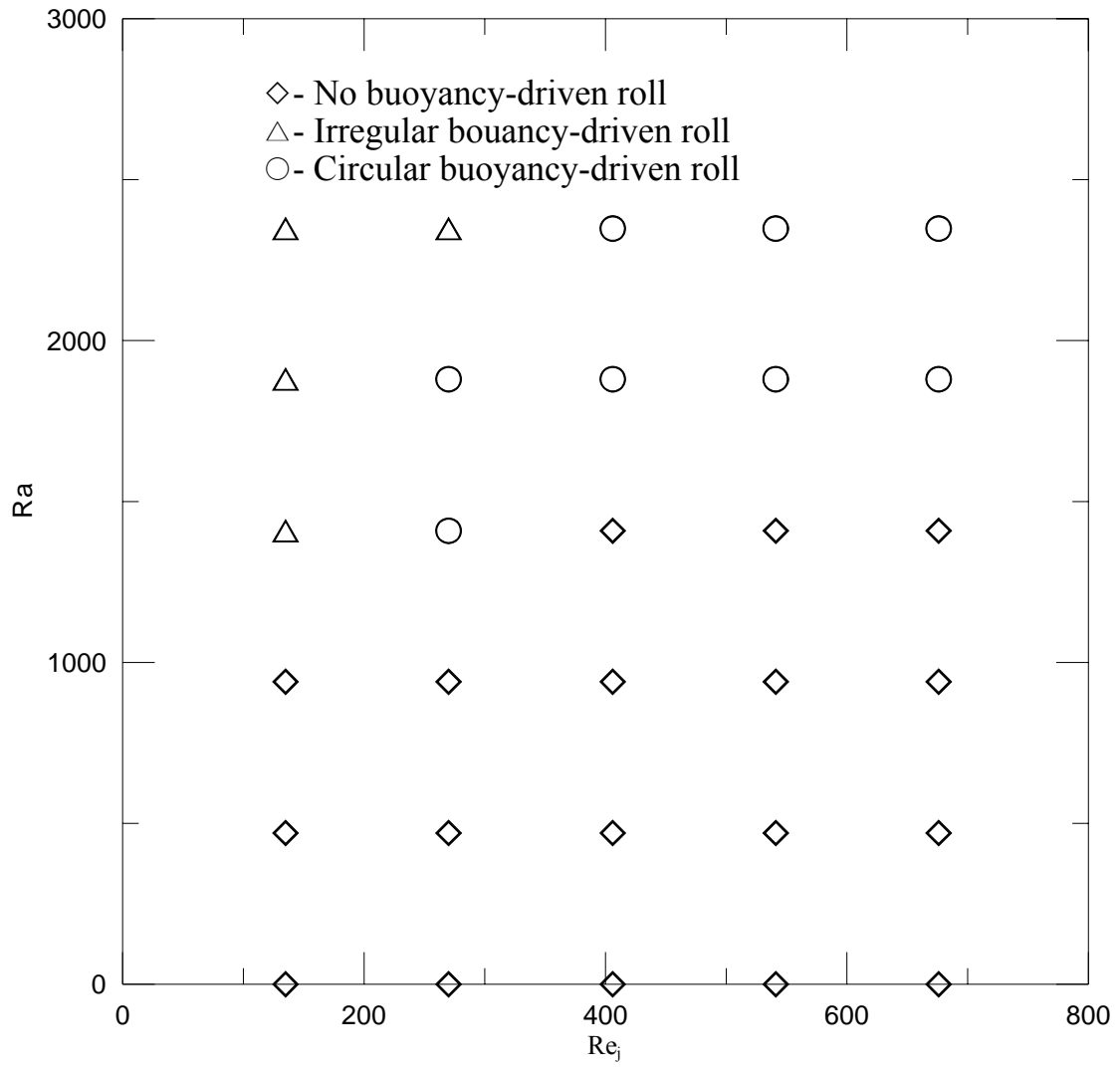


Fig. 4.54 Flow region map for different buoyancy-driven flow patterns at  $H = 10.0$  mm (25 cases).

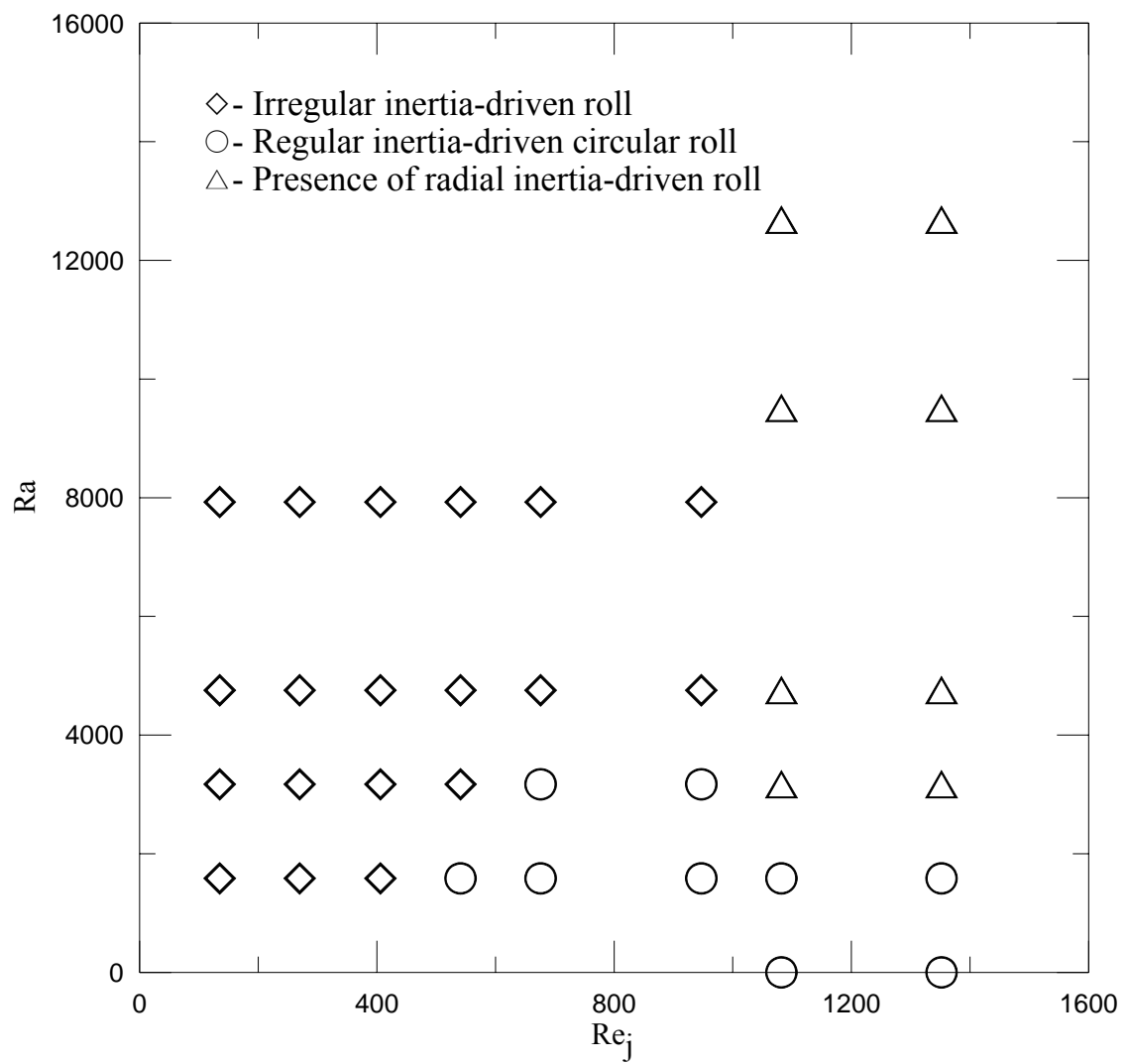


Fig. 4.55 Flow region map for different inertia-driven flow patterns at  $H = 15.0$  mm (36 cases).