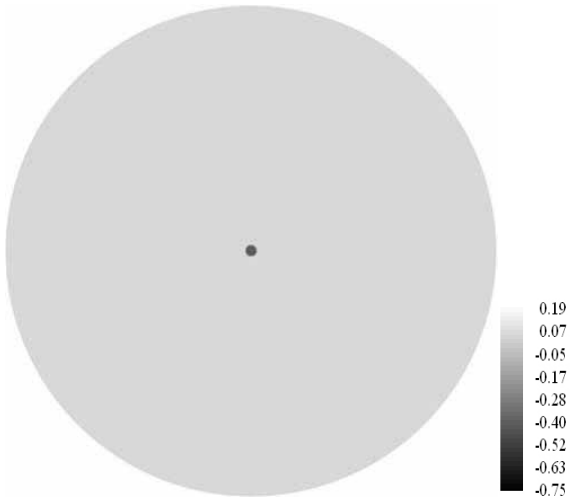
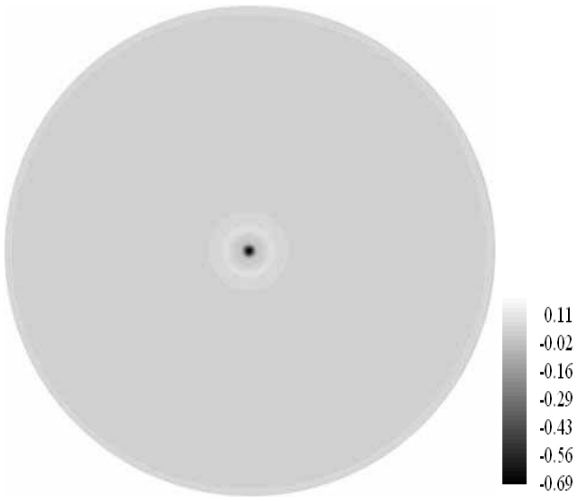
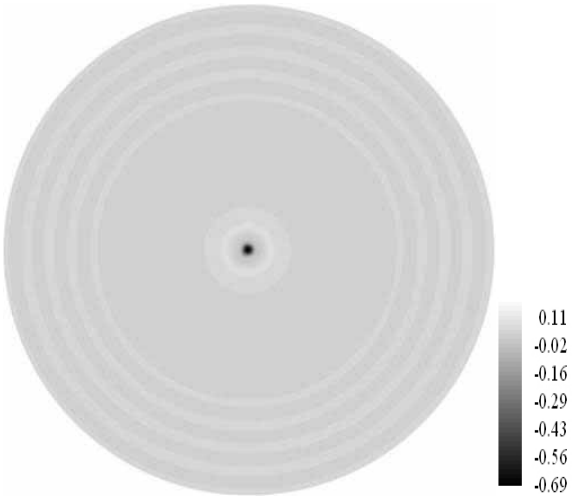


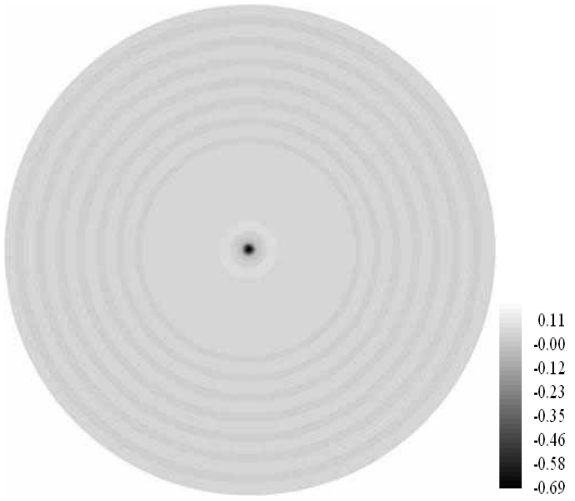
(a)



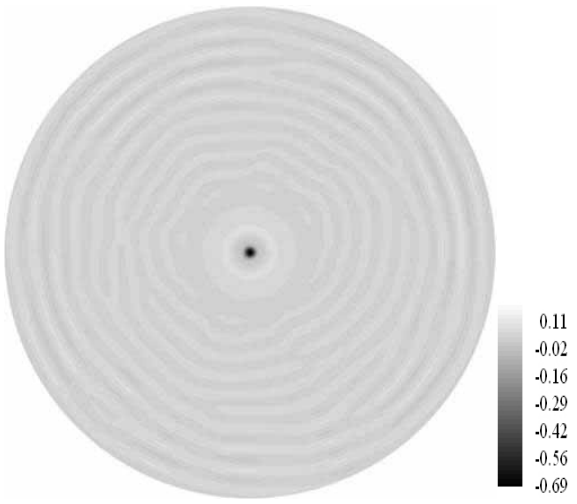
(b)



(c)

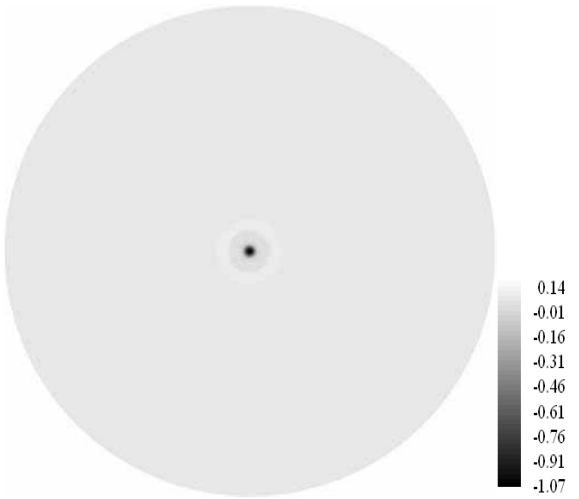


(d)

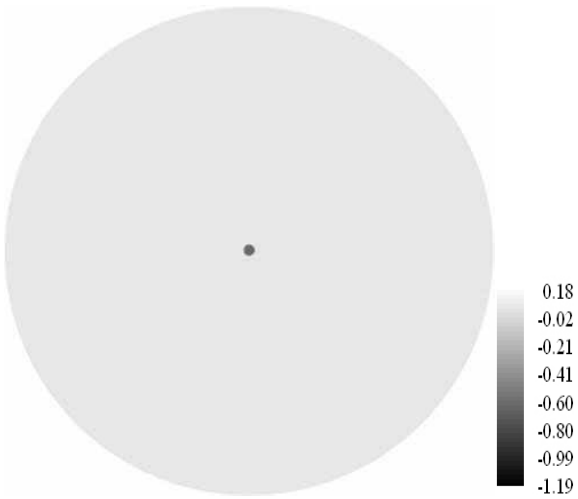


(e)

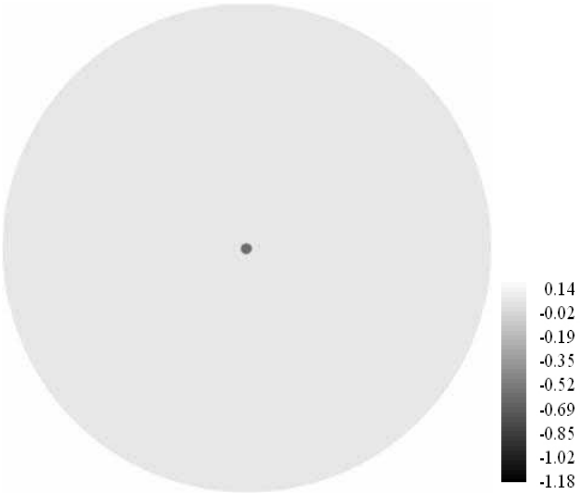
Fig. 4.38 Contours of vertical velocity component w at the horizontal plane z = - 5 mm at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 270 (Q_j= 2.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).



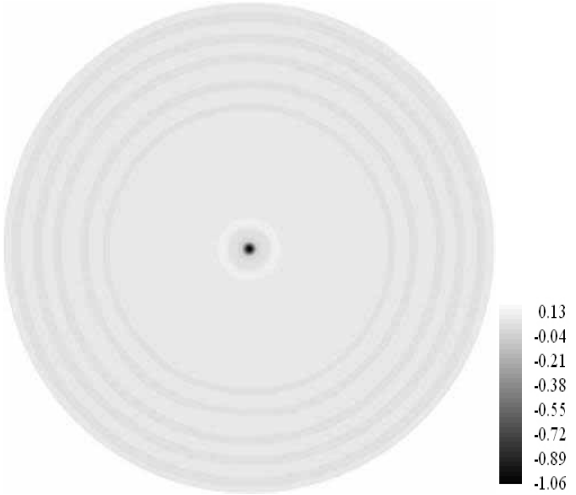
(a)



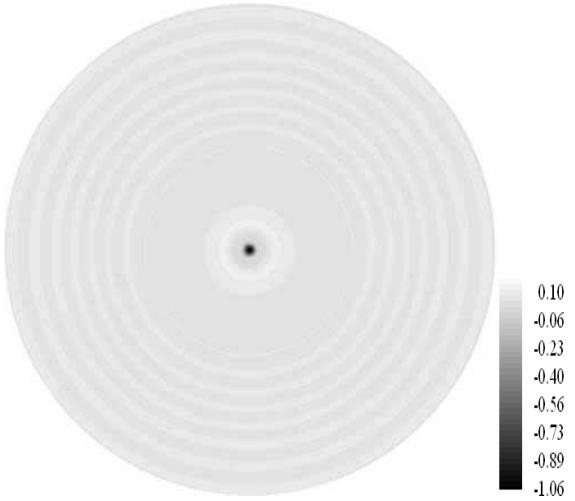
(b)



(c)



(d)



(e)

Fig. 4.39 Contours of vertical velocity component w at the horizontal plane z = - 5 mm at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 406 (Q_j= 3.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).

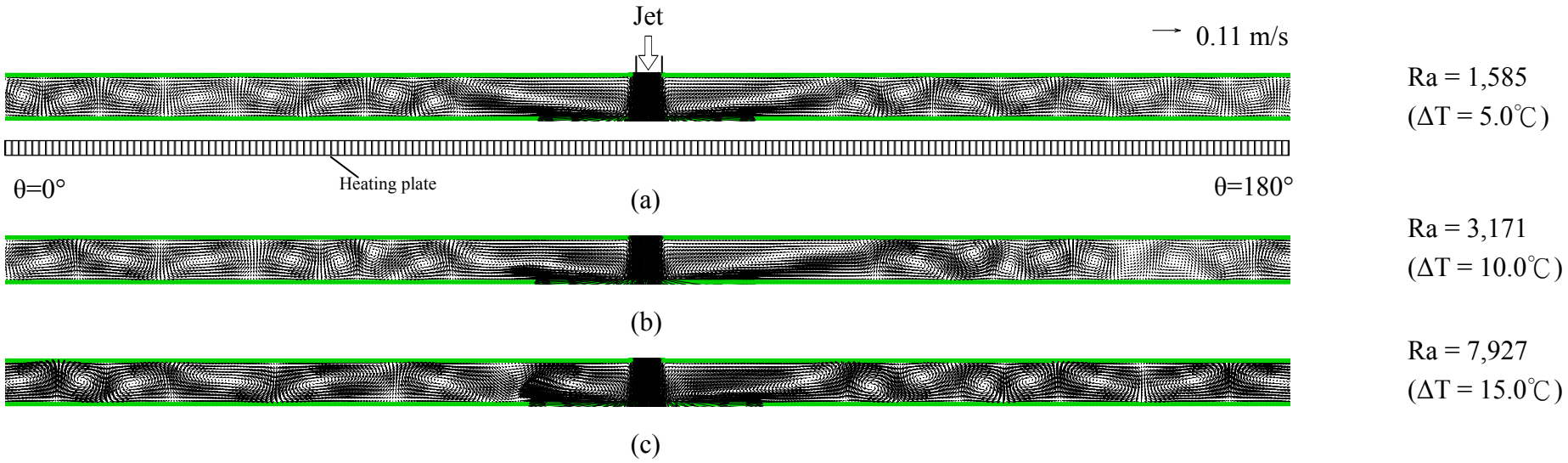


Fig. 4.40 Velocity vectors at certain time instants in statistical state on the cross plane θ = 0° & 180° for D_j = 10.0 mm, H = 10.0 mm, Re_j = 406 (Q_j= 3.0 slpm) for Ra = (a) 1,585 (ΔT = 5.0℃), (b) 3,171 (ΔT = 10.0℃), and (c) 7,927 (ΔT = 15.0℃).

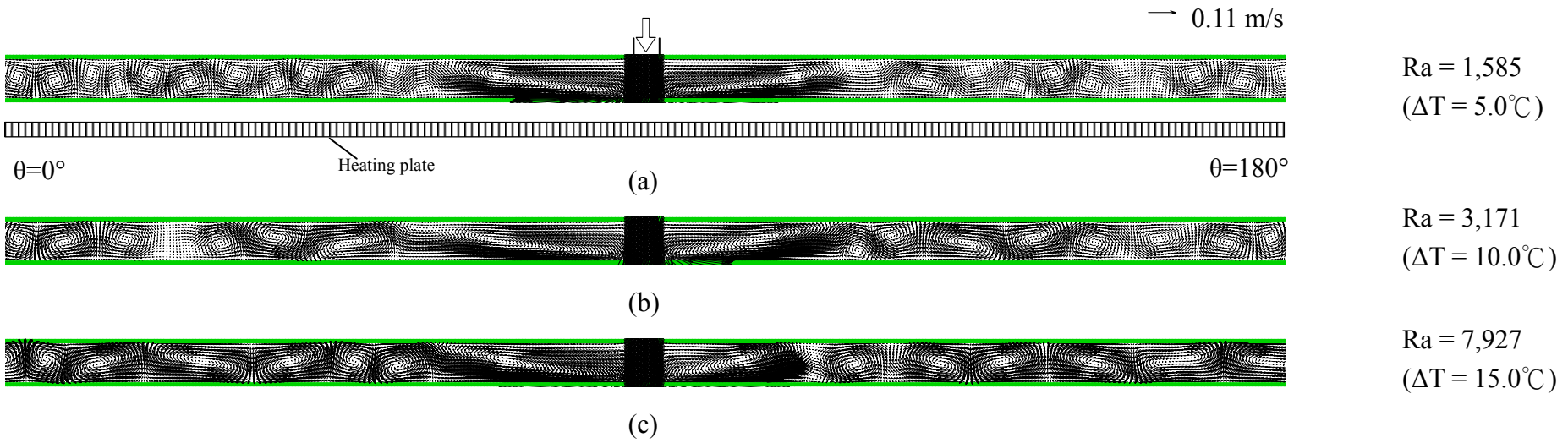


Fig. 4.41 Velocity vectors at certain time instants in statistical state on the cross plane θ = 0° & 180° for D_j = 10.0 mm, H = 10.0 mm, Re_j = 541 (Q_j= 4.0 slpm) for Ra = (a) 1,585 (ΔT = 5.0℃), (b) 3,171 (ΔT = 10.0℃), and (c) 7,927 (ΔT = 15.0℃).

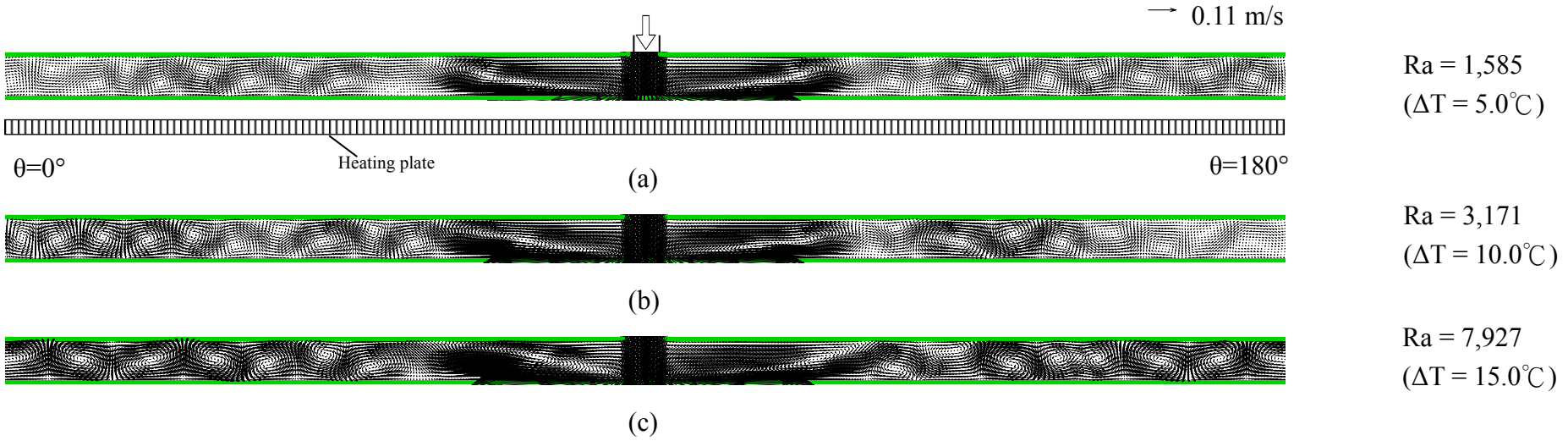


Fig. 4.42 Velocity vectors at certain time instants in statistical state on the cross plane θ = 0° & 180° for D_j = 10.0 mm, H = 10.0 mm, Re_j = 676 (Q_j= 5.0 slpm) for Ra = (a) 1,585 (ΔT = 5.0℃), (b) 3,171 (ΔT = 10.0℃), and (c) 7,927 (ΔT = 15.0℃).

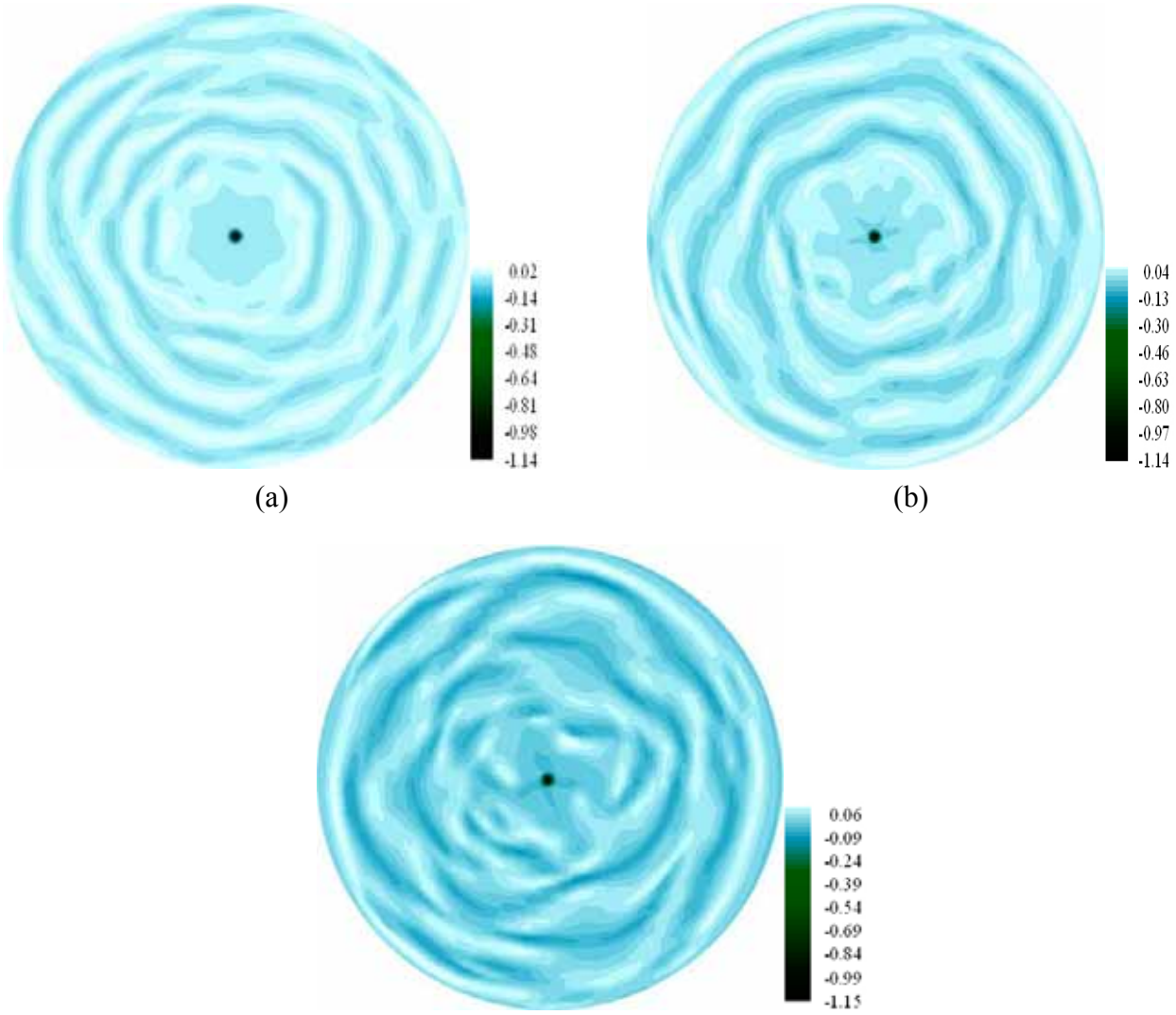


Fig. 4.43 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for D_j = 10.0 mm, H = 15.0 mm, Re_j = 406 (Q_j= 3.0 slpm) for Ra = (a) 1,585 ($\Delta T = 5.0^{\circ}C$), (b) 3,171 ($\Delta T = 10.0^{\circ}C$), and (c) 7,927 ($\Delta T = 15.0^{\circ}C$).

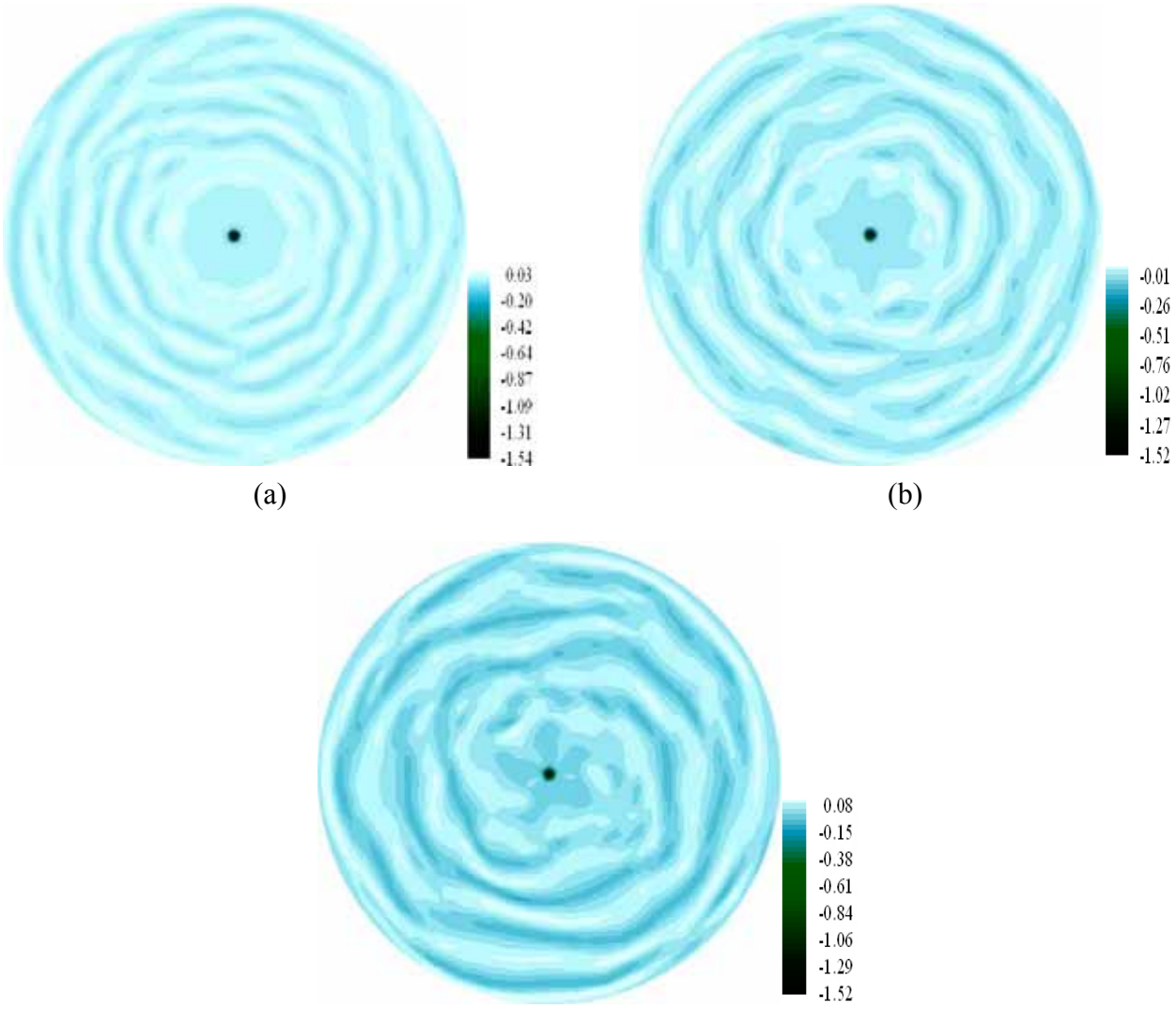


Fig. 4.44 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for D_j = 10.0 mm, H = 15.0 mm, Re_j = 541 (Q_j= 4.0 slpm) for Ra = (a) 1,585 (ΔT = 5.0℃), (b) 3,171 (ΔT = 10.0℃), and (c) 7,927 (ΔT = 15.0℃).

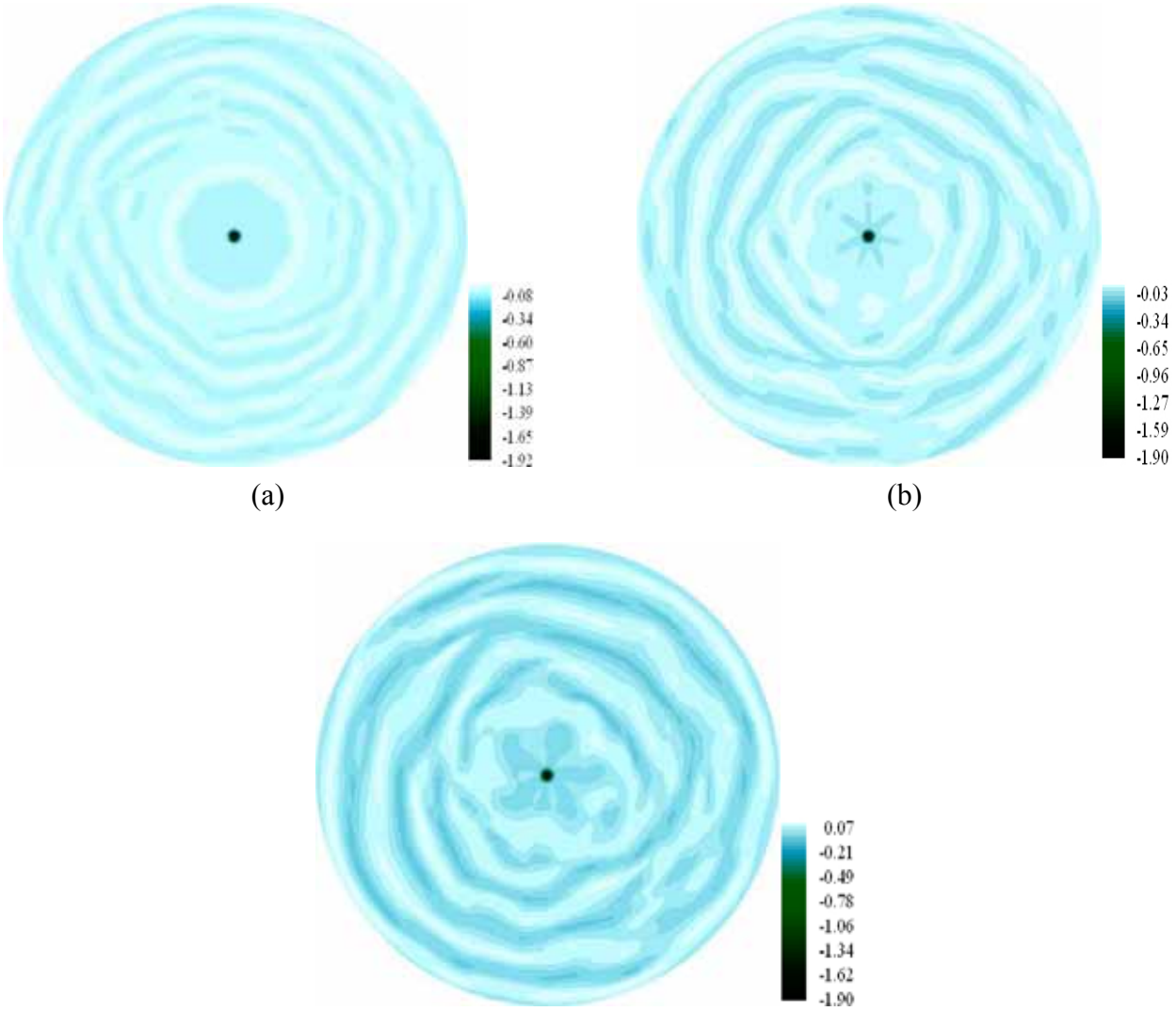


Fig. 4.45 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for D_j = 10.0 mm, H = 15.0 mm, Re_j = 676 (Q_j= 5.0 slpm) for Ra = (a) 1,585 (ΔT = 5.0℃), (b) 3,171 (ΔT = 10.0℃), and (c) 7,927 (ΔT = 15.0℃).

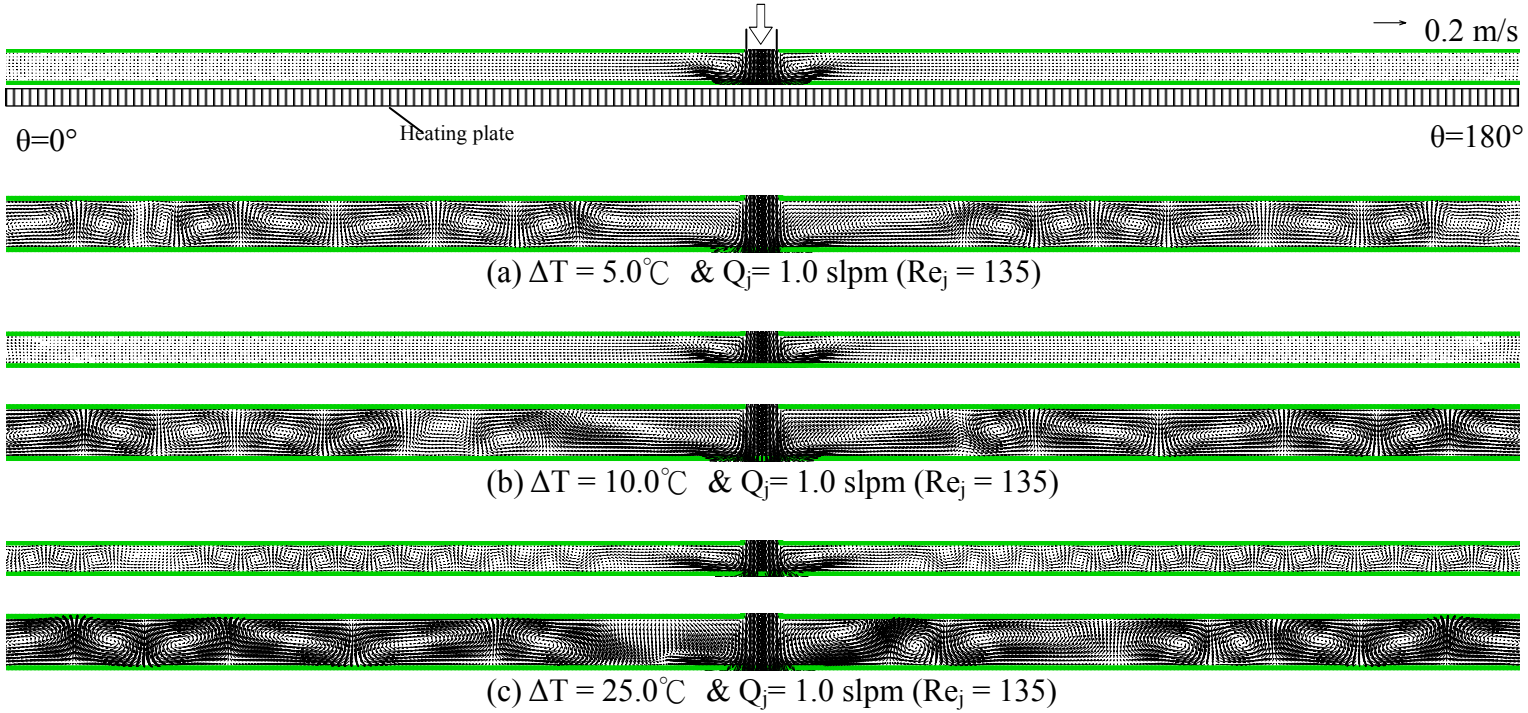


Fig. 4.46 Velocity vectors on the cross plane θ = 0° & 180° at certain time instants in steady or statistical state for H = 10.0 & 15.0 mm for D_j = 10.0 mm, Re_j = 135 (Q_j= 1.0 slpm) for ΔT = (a) 5.0℃, (b) 10.0℃, and (c) 25.0℃.

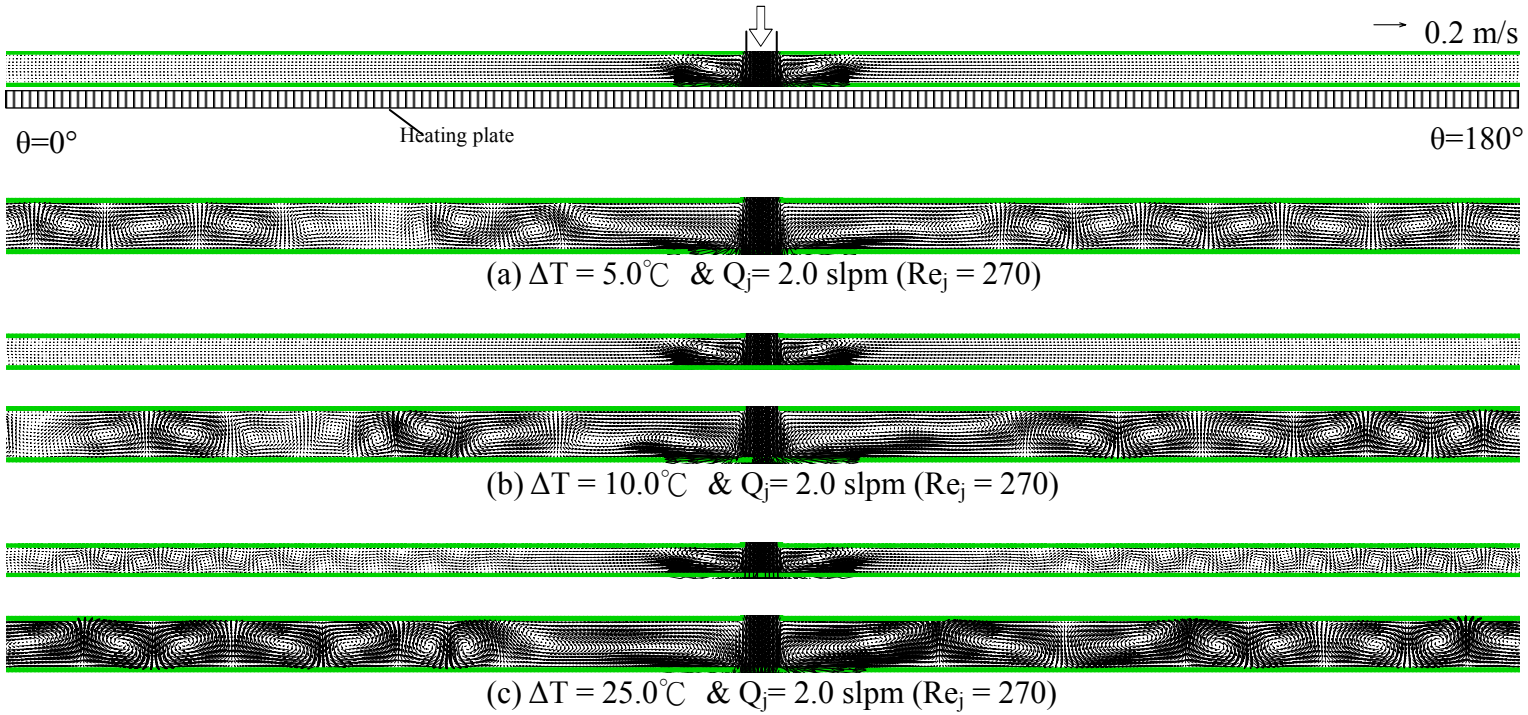


Fig. 4.47 Velocity vectors on the cross plane θ = 0° & 180° at certain time instants in steady or statistical state for H = 10.0 & 15.0 mm for D_j = 10.0 mm, Re_j = 270 (Q_j= 2.0 slpm) for ΔT = (a) 5.0℃, (b) 10.0℃, and (c) 25.0℃.