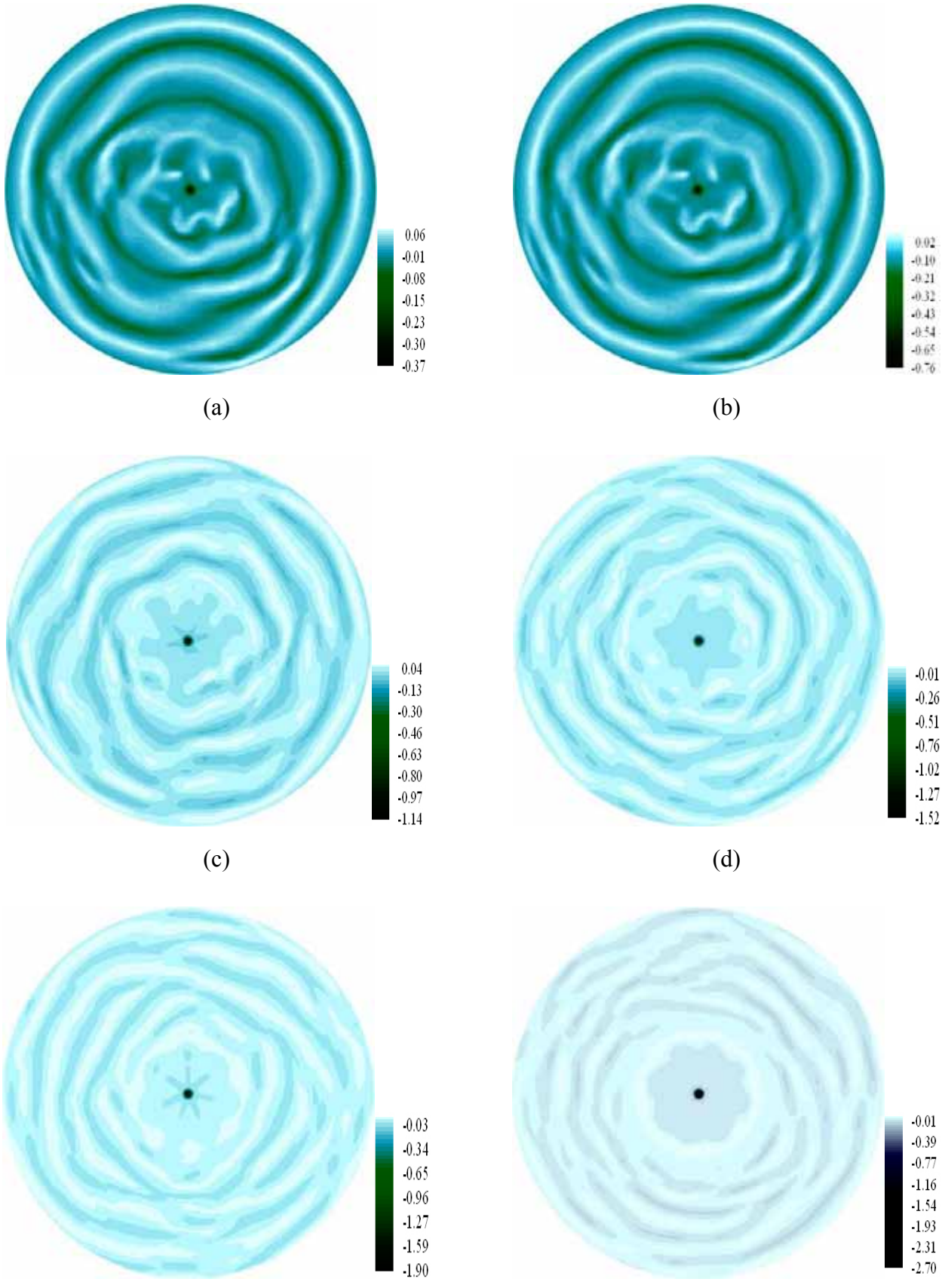


Fig. 4.28 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for Ra = 3,171 ($\Delta T = 10.0℃$) and D_j = 10.0mm at H = 15.0 mm for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, (e) 676, and (f) 947.

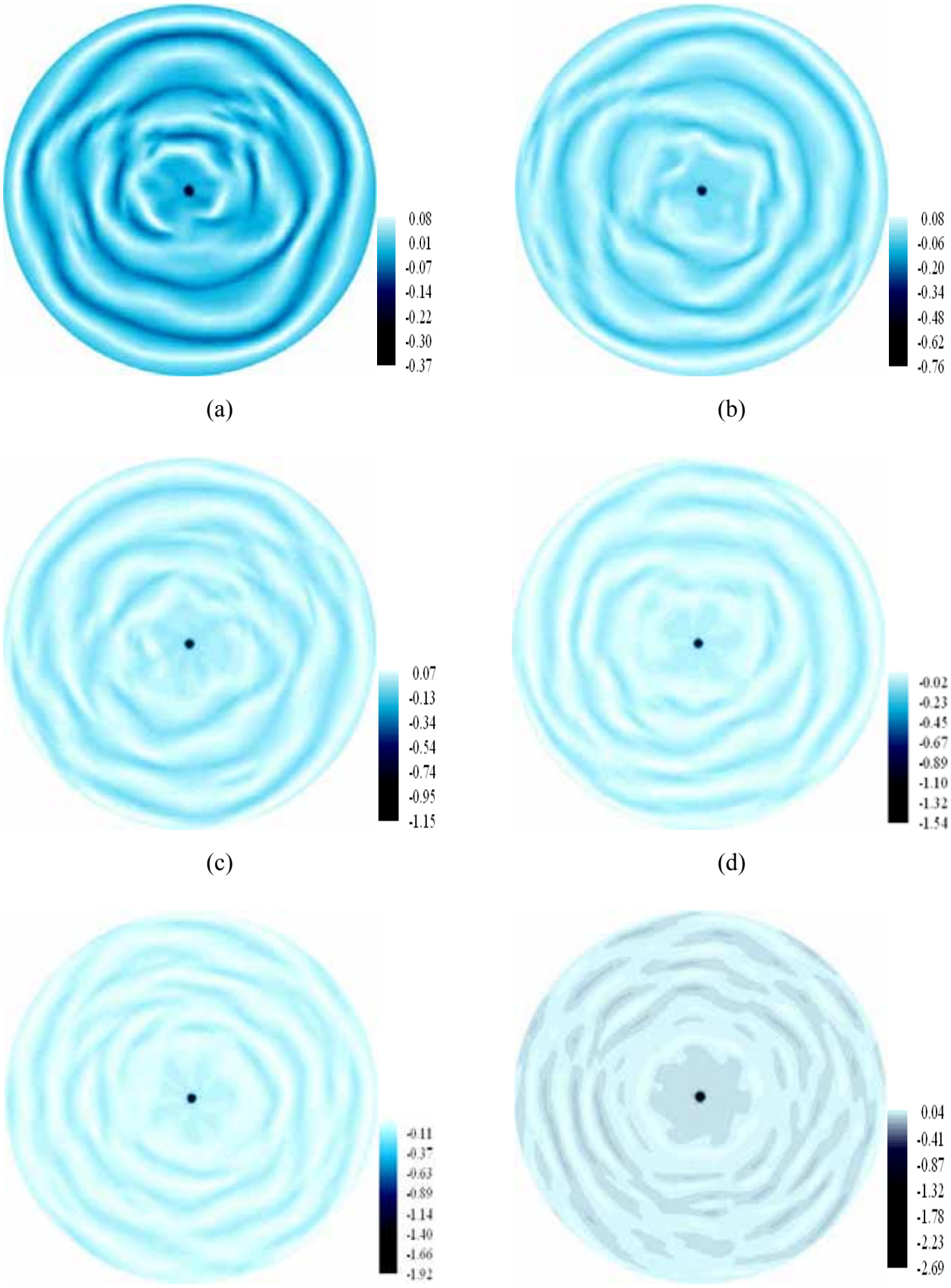


Fig. 4.29 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for Ra = 4,756 ($\Delta T = 15.0℃$) and D_j = 10.0mm at H = 15.0 mm for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, (e) 676, and (f) 947.

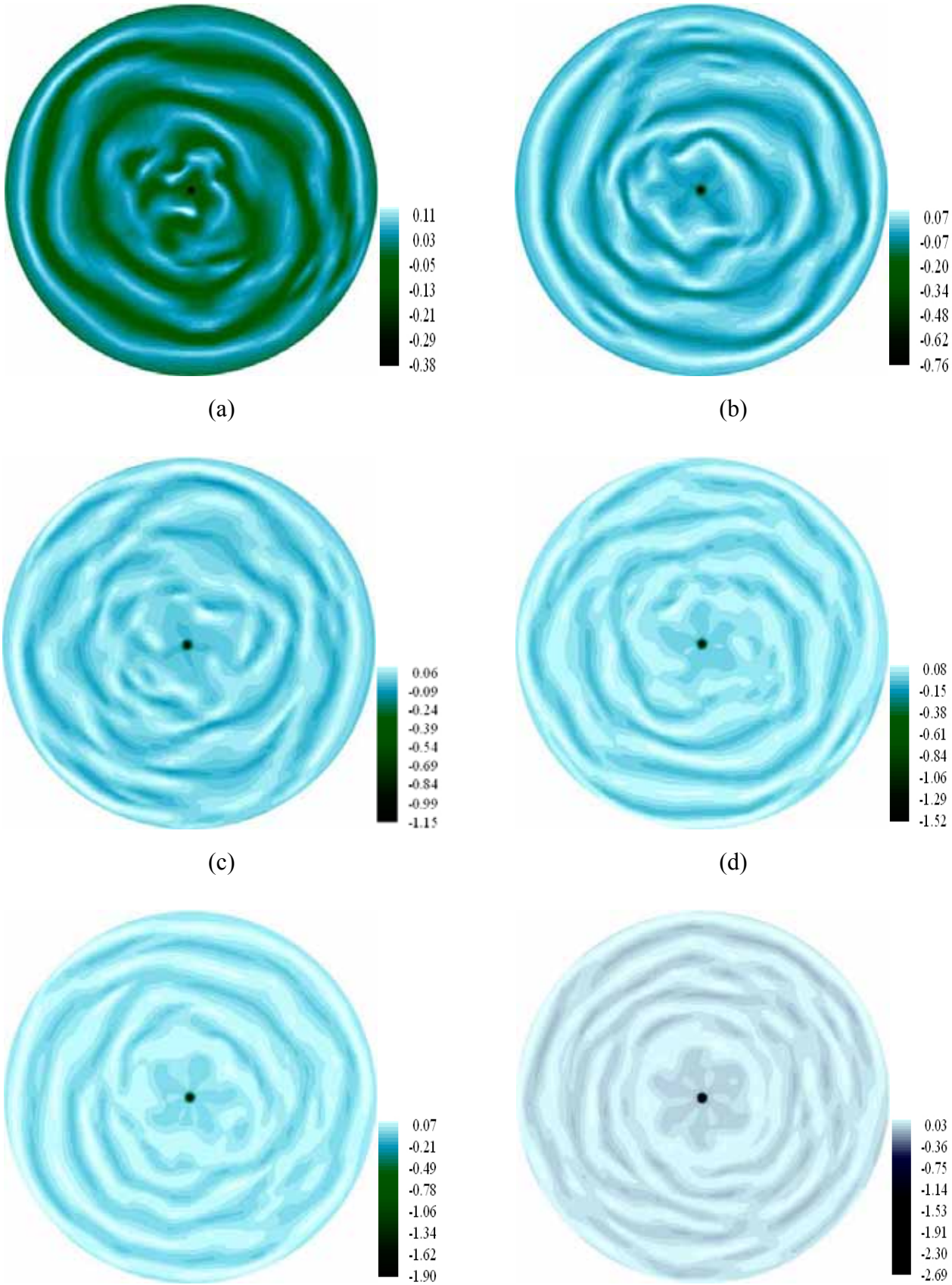
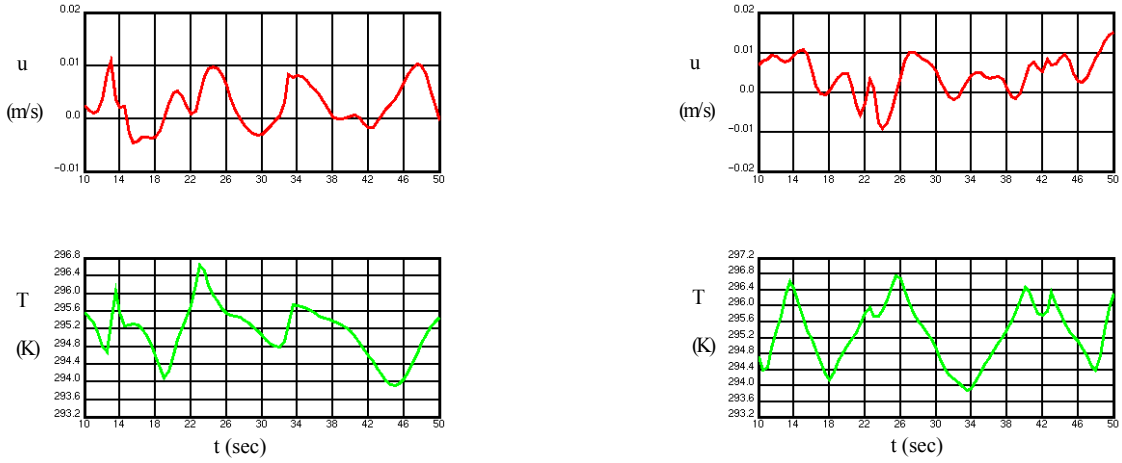
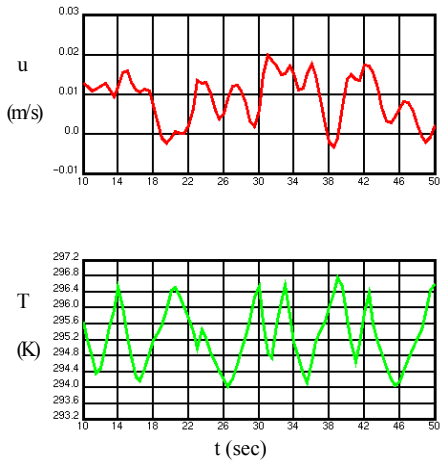


Fig. 4.30 Contours of vertical velocity component w at the horizontal plane z = - 7.5 mm at certain time instants in statistical state for Ra = 7,927 (ΔT = 25.0℃) and D_j = 10.0mm at H = 15.0 mm for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, (e) 676, and (f) 947.

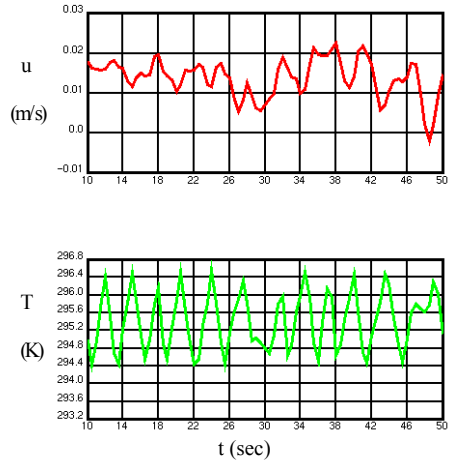


(a)

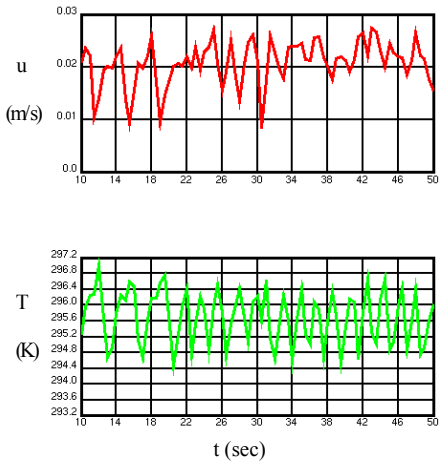
(b)



(c)

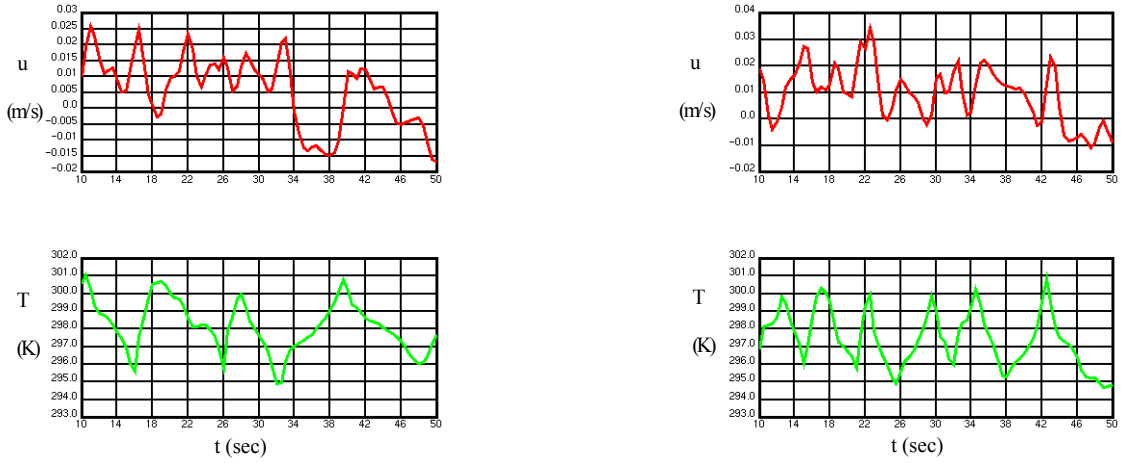


(d)



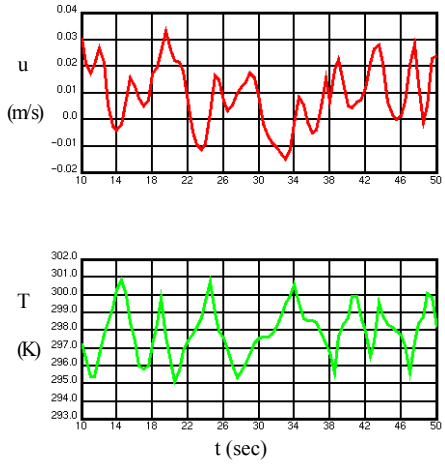
(e)

Fig. 4.31 Time records of radial velocity component u and temperature at the location r = 100 mm, θ = 0° , z = - 7.5 mm for D_j = 10.0mm, H = 15.0 mm, and Ra = 1,585 (ΔT = 5.0℃) for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, and (e) 676.

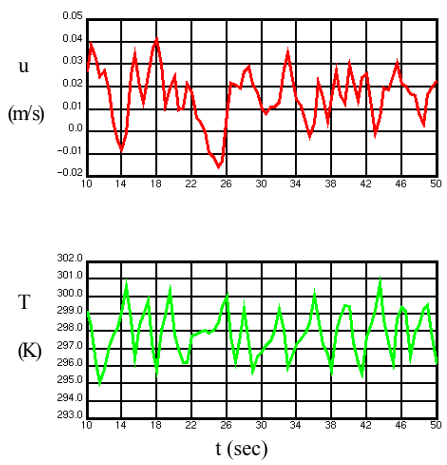


(a)

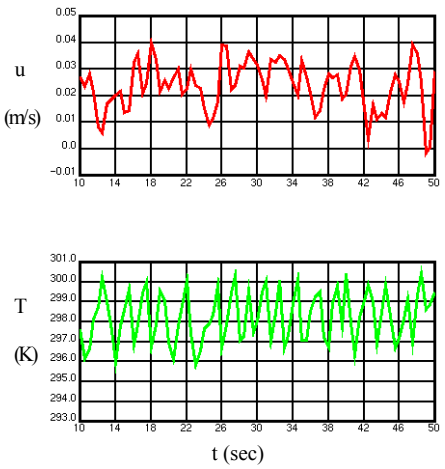
(b)



(c)

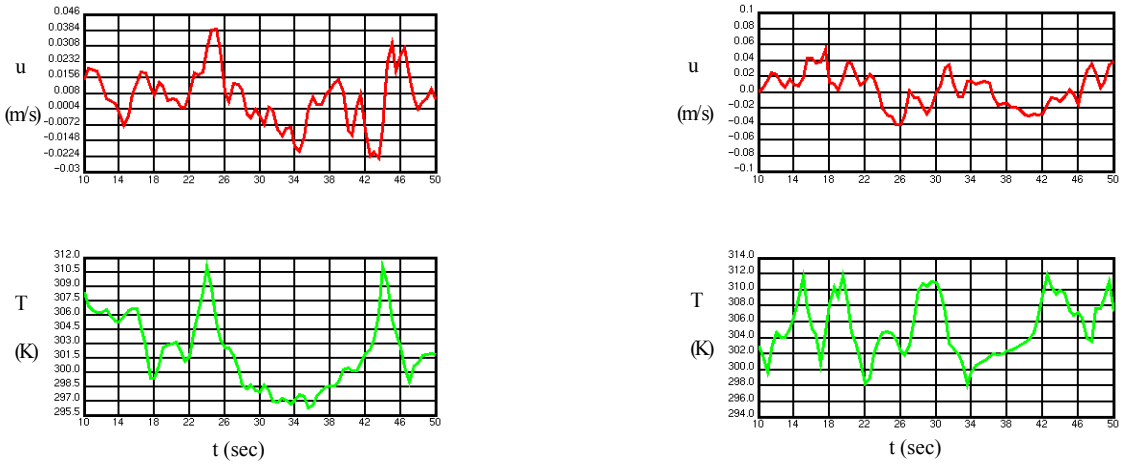


(d)

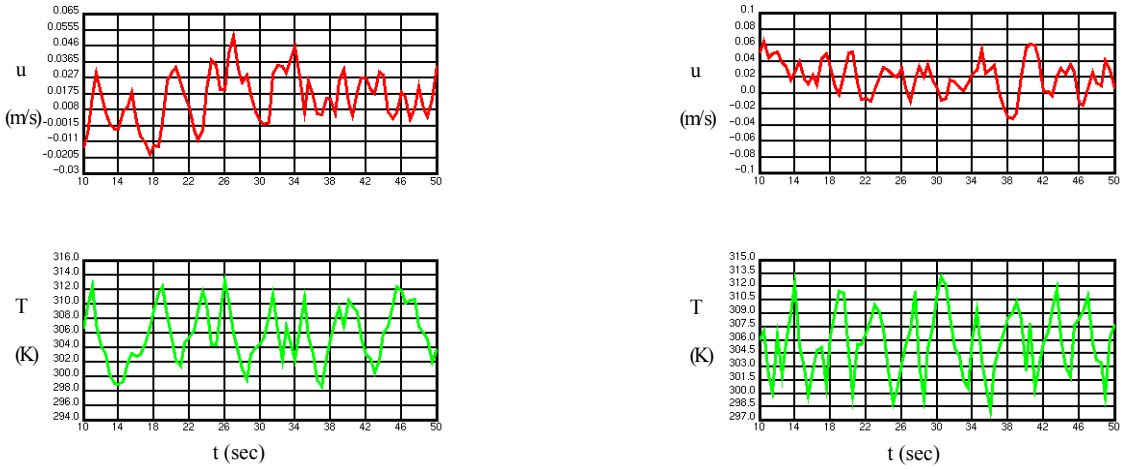


(e)

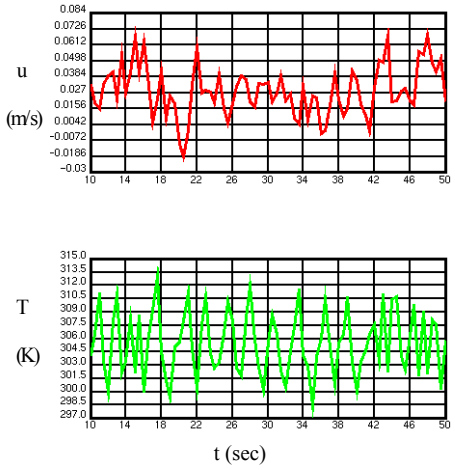
Fig. 4.32 Time records of radial velocity component u and temperature at the location r = 100 mm, θ = 0° , z = - 7.5 mm for D_j = 10.0mm, H = 15.0 mm, and Ra = 3,171 (ΔT = 10.0℃) for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, and (e) 676.



(a) (b)



(c) (d)



(e)

Fig. 4.33 Time records of radial velocity component u and temperature at the location r = 100 mm, θ = 0° , z = - 7.5 mm for D_j = 10.0mm, H = 15.0 mm, and Ra = 7,927 (ΔT = 25.0℃) for Re_j = (a) 135, (b) 270, (c) 406, (d) 541, and (e) 676.

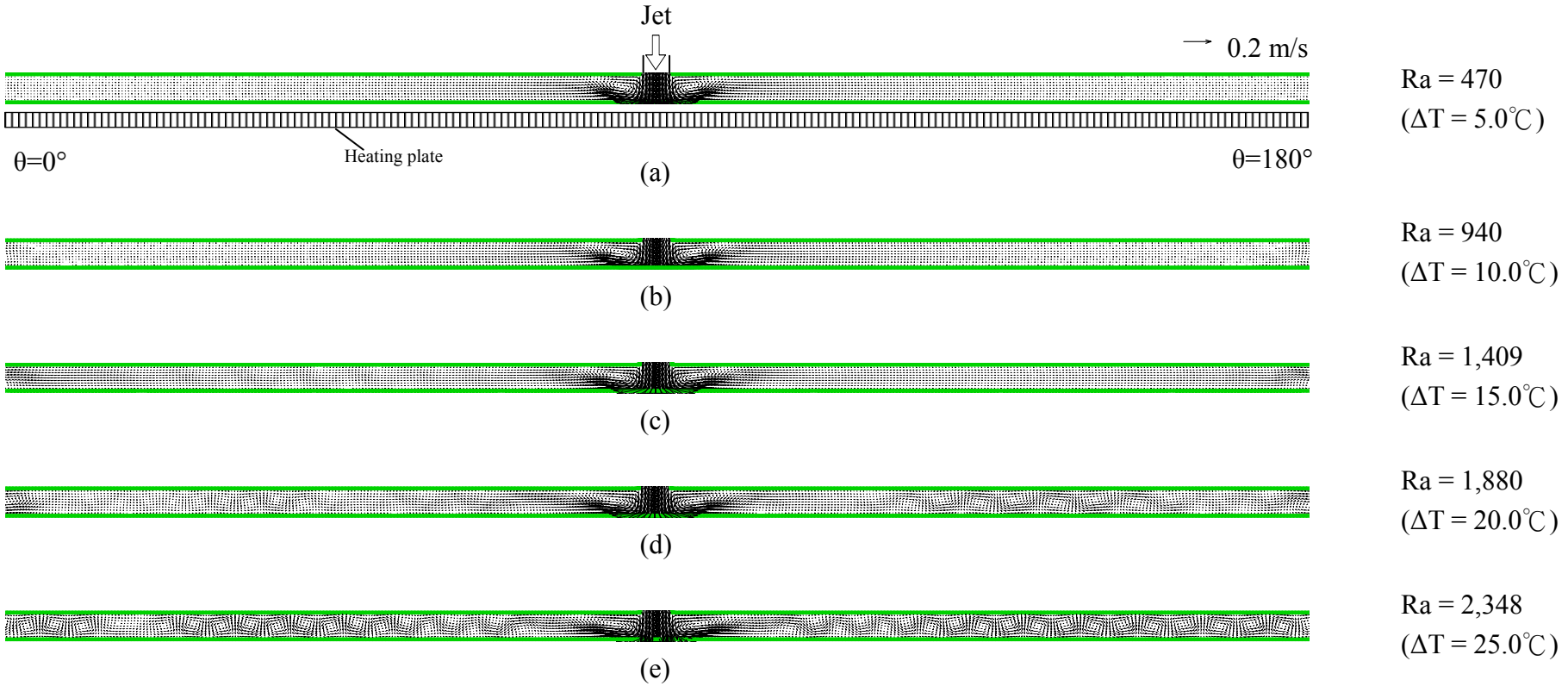


Fig. 4.34 Velocity vectors on the cross plane θ = 0° & 180° at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 135 (Q_j= 1.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).

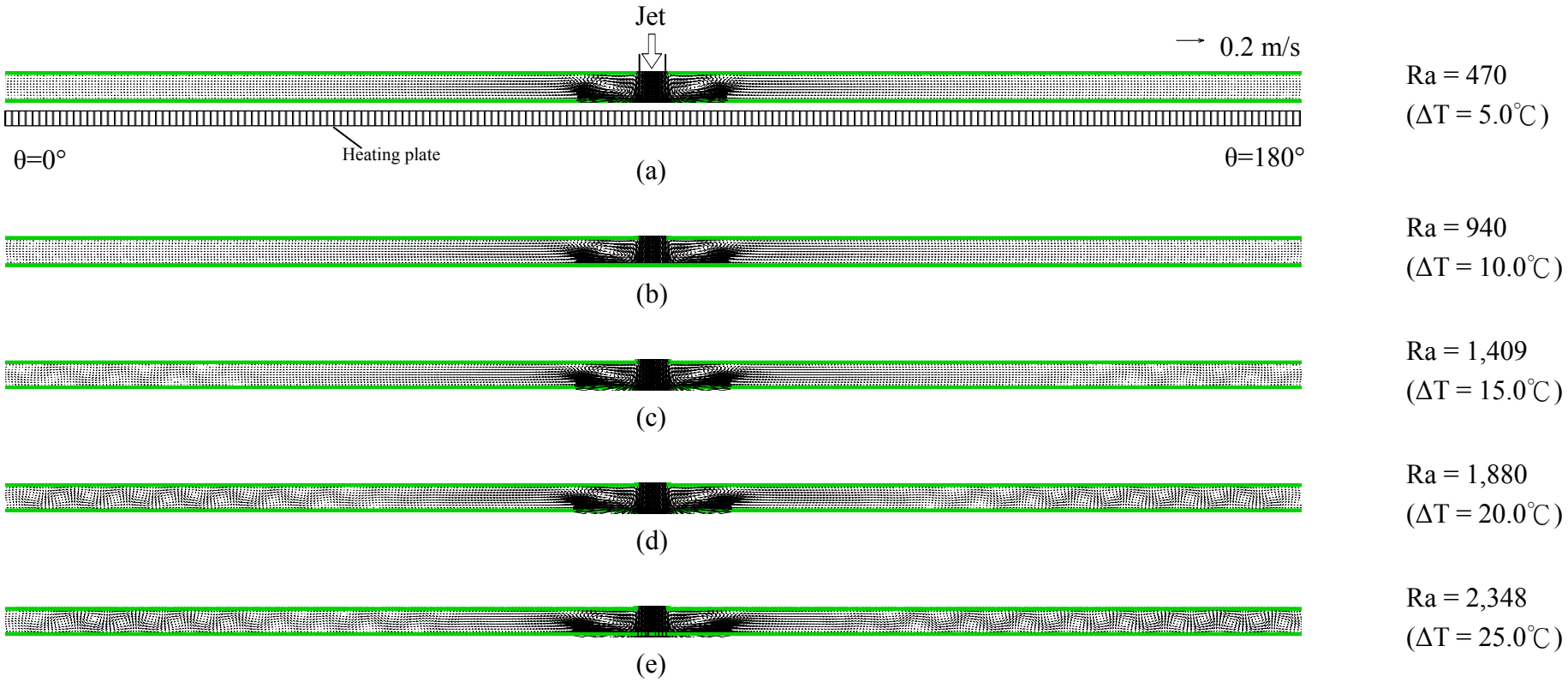


Fig. 4.35 Velocity vectors on the cross plane θ = 0° & 180° at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 270 (Q_j= 2.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).

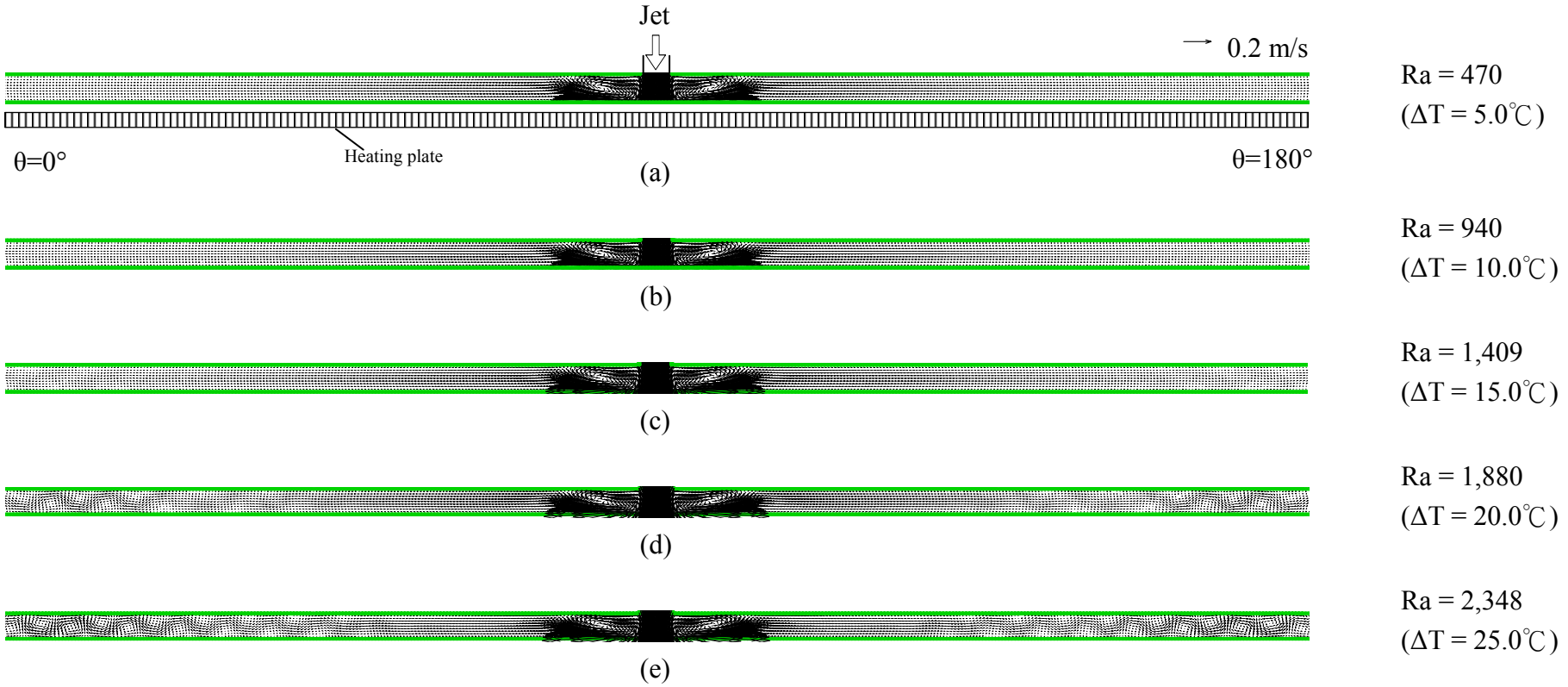


Fig. 4.36 Velocity vectors on the cross plane θ = 0° & 180° at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 406 (Q_j= 3.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).

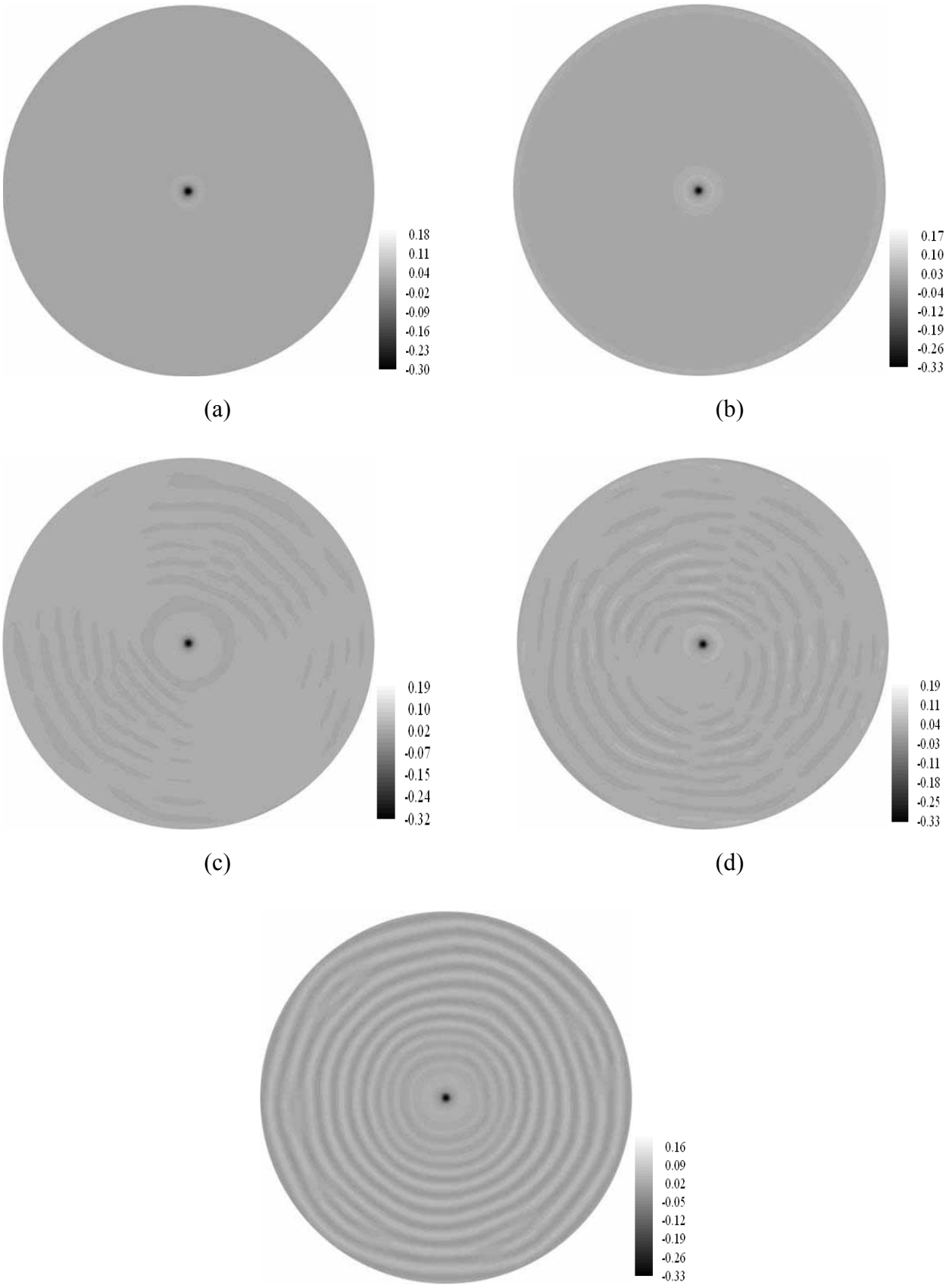


Fig. 4.37 Contours of vertical velocity component w at the horizontal plane z = - 5 mm at certain time instants in statistical or steady state for D_j = 10.0 mm, H = 10.0 mm, Re_j = 135 (Q_j= 1.0 slpm) for Ra = (a) 470 (ΔT = 5.0℃), (b) 940 (ΔT = 10.0℃), (c) 1,409 (ΔT = 15.0℃), (d) 1,880 (ΔT = 20.0℃), and (e) 2,348 (ΔT = 25.0℃).