Hormuz to the northern part of the PG from winter to summer with the most rates in mid spring and the highest temperature gradient in the summer.

The model-simulated thermocline depth is generally consistent with the observations derived from measurements according to the diagrams in Fig. 5. According to the theoretical results, we conclude that in the Persian Gulf, thermocline can form in summer, despite of in winter. The seasonal thermocline in the PG is developed from winter to early summer 0.2 m/day in the mid part of the PG and 0.1 m/day in other parts. Also, the main changes of temperature between the surface layer and sub-surface layer occur in the mid part from 0.1℃ in winter to 3.5℃ in summer while the highest temperature difference through the water column in summer is 9℃.

References:

[1] Alosairi Y1, Pokavanich T, Seasonal circulation assessments of the Northern Arabian/Persian Gulf, *Mar Pollute Bull.*, 2017 Mar 15; 116(1-2), 2016, pp.270-290.

[2] Delphi, M., and Mosaddad, S.M, Formation of Summer Thermocline in the Persian Gulf, *Int. J. Environmental Science and Development*, Vol.1, No.5, 2010, 3p.

[3] Hautala, S, Internal gravity waves, *J. of Ocean*, Vol. 40, 2001, 4p.

[4] Hodges, B.R., et al, Modeling the Hydrodynamics, Hydronformatics 2000 conference, (2000), 2000, 14p.

[5] Kampf ¨ J. and Sadrinasab M, The circulation of the Persian Gulf: a numerical study, *J. of Ocean Sci.*, Vol. 2, 2006, pp. 27–41.

[6] Mellor, G.L., and Blumberg, A.F., Modeling vertical and horizontal diffusivities with the sigma coordinate system, *Mon. Wea. Rev*, 113, 1985, pp.1380-1383.

[7] Seibold, E. and Ulrich, J, ZurBodengestalt des nordwestlichen Golfs von Oman. *"Meteor" Forsch. Ergebnisses*, Reihe C, 3, 1970, pp. 1–14.

[8] Swift, S.A. and A.S. Bower, Formation and circulation of dense water in the Persian Gulf, *J. of Geophys. Res.*, Woods Hole Oceanographic institution, Vol. 108, 2003, 32p.