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Turbulent structure beneath water surface during natural convection KAMRAN SIDDIQUI, SYED JUNAID BUKHARI, Concordia University — Natural convection is an important phenomenon observed in a coupled air-water system during which the water surface undergoes evaporative cooling. A better knowledge of the flow structure is important in order to improve our understanding of the physical mechanisms that control the air-water heat exchange during this process. We report on a series of laboratory experiments conducted to investigate the near-surface flow structure beneath water surface during natural convection. The measurements were made at different magnitudes of the air-water heat flux. The results have shown that the flow field undergoes different flow interactions locally, which forms complex flow structure. Results have also shown that the turbulent velocity profiles are self-similar and that the scaling parameters developed for the natural convection above a heated wall are also applicable to the natural convection below an evaporative water surface. The interaction of the turbulent motions with the buoyancy forces will also be discussed.

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