Enhancement of vertical mixing by internal structures in an open raceway pond

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Microalgae are usually cultivated in open raceway ponds for mass production. Typical raceway ponds are composed of rectangular channels, hairpin bends and a paddle wheel. Sunlight is one of important factors for the growth of microalgae. To expose microalgae to sunlight, vertical mixing is important in the raceway pond. In this study, we suggest various internal structures to enhance vertical mixing of microalgae. Different structure designs are introduced for rectangular channels and hairpin bends. We carried out numerical simulation of fluid flow in the new design of open raceway pond with commercial computational fluid dynamic (CFD) software. Through this strategy, microalgae can move to the surface and have more chance to receive sunlight.