

عنوان مقاله:

Wave Generation in a Numerical Wave Tank

محل انتشار:

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خلاصه مقاله:

Developing numerical tanks to study wave structure interaction drew engineers' attention in last decade. Numerical wave tanks are absolutely essential for investigating wave-structure interaction. This paper presents two different numerical software capabilities to generate regular gravity waves in a wave tank. The wave generation was performed using the FLUENT package and Flow-3D. Both models are based on Navier-Stokes and VoF equations. The results of the mentioned models were compared with theoretical results. Free surface elevation and horizontal component of wave particle velocity were the two parameters which have been considered for comparison. Results indicate that Flow-3D in some cases is a bit more accurate than Fluent in capturing free surface elevation. In numerical models it is important to dissipate wave energy and prevent wave reflection. In this way four different slopes were evaluated to determine the minimum slope needed for wave energy dissipation. The results showed that a minimum slope of 1V:35H is needed to avoid wave reflection. The variation of streamlines and velocity potential are also studied. The pattern of horizontal and vertical velocity variation in the fluid domain is similar to stream function and potential velocity function variation, respectively

کلمات کلیدی:

wave tank, numerical, Navier Stokes equation, VOF, regular wave, streamline

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