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Positron Emission Particle Tracking (PEPT): Data analysis techniques for tracking multiphase flows

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PEPT is a radioactive particle tracking method, based on the medical imaging technique of positron emission tomography. PEPT can track the movement of a positron-emitting tracer as it moves within a multiphase fluid. An example application is froth flotation, a mineral separation process which utilises gas bubbles to separate the solid minerals based on hydrophobicity. The dense suspension created in the flotation cell is difficult to characterise internally, because it is opaque and contains fragile bubble structures. This study reviews a range of the available location techniques for PEPT to determine the most effective method to track particle motion in a flotation vessel. The challenges of PEPT for flotation arise from trying to locate a tracer particle in three phase media of varying attenuation and highly dynamic flows with high rates of particle acceleration. These factors lead to higher uncertainty in the 3D position and time measurements of the particle location.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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