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Abstract	:	Velocity is one of the crucial parameters in the multiphase flow especially gas-solid two-phase flow. Electrical capacitance tomography (ECT) offers robust, inexpensive, non-invasive and non-intrusive techniques for quantifying multiphase flow phenomena. This paper demonstrates a method to estimate average axial velocity through cross-correlation method between dual plane ECT sensors by Parseval's theorem in the frequency domain. In an addition, parabolic fit interpolation was introduced to optimize the time delay calculation. Three cases with different position of PMMA ball in ECT sensor was studied coupled with noise added in the range 5% to 20%. The results show cross-correlation in frequency domain successfully estimates the average axial velocity with 5.5% and reduce to 4% after parabolic fit interpolation treatment.