

# Studies of Streaming Potential Generated by a Two-phase Flow

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Water coning is a serious problem in managing reservoir recoveries. In order to control water coning or minimize the impact of unwanted water in oil wells, a novel technique which can detect water encroachment using electrokinetic phenomena has been proposed. However, the lack of understanding of the underlying physics precludes its use in practical systems. To fill this gap, we are developing a mathematical model and experiments to understand the streaming potential generated by a two-phase flow in a model system. Outcomes to date include

- Application of the phase-field method to track the motion and the shape of one-phase droplet suspended into another-phase liquid
- Development of a measurement system capable of automatically recording streaming potentials
- Real-time measurement of the change of the streaming potential induced by the presence of an oil droplet in water

