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RESPONSE

Mr Crowley is quite correct in his analysis of our model. There are two such solutions. This is pointed out in the recent thesis by Janicot (1988) where he also demonstrates that for each fluid property pair there are maximum possible values of C_0. Consistent with our speculation as to the mechanism in the paper, we suggest that the transition from slug to annular flow takes place *at the smallest void fraction which satisfies both models.* This is the condition at which surface tension can first cause the fluid to wrap around the pipe in the annular configuration. It should be noted that we did not use the value of C_0 suggested by Chen & Downing as Crowley indicates. Our value was obtained directly from measurements we made on the Sundstrand films.

Crowley's suggestion that Barnea's model be used for this transition is unpalatable for the case of reduced gravity. That model is strongly dependent on the idea that the slugs contain about 30% voids at the high gas rates when transition to annular flow is observed, and this simply is not the experimental result for microgravity.

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