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**Flow characteristics in hydraulically equilibrium two-phase flows in a vertical  $2 \times 3$  rod bundle channel.** (English) [Zbl 1136.76627](#)

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Summary: In order to increase data on two-phase flow distribution in a multi-subchannel system, being similar to a rod bundle, experiments have been carried out using water and air at ambient pressure and temperature as the working fluids and a newly constructed  $2 \times 3$  rod bundle channel as the test channel. The channel contained six rods in rectangular array and two-kinds of six subchannels, simulating a BWR fuel rod bundle. Experimental data on flow distribution and pressure drop along each subchannel axis were obtained in various single- and two-phase flows under a hydraulic equilibrium flow condition. From the measured pressure drop in the single-phase flow, friction factor data in each subchannel were obtained. The two-phase pressure drop data were compared with calculations by a simple, one-dimensional, one-pressure two-fluid model. In addition, Taylor bubble velocity in each subchannel in slug-churn flows was measured with a double needle contact probe. Using the bubble velocity data, we obtained a subchannel void fraction in each subchannel, and discussed a relationship of the subchannel void fractions between two different subchannels. Results of such experiments and discussions are presented in this paper.

**MSC:**

[76Txx](#) Multiphase and multicomponent flows

**Keywords:**

[subchannel analysis](#); [rod bundle](#); [hydrodynamic equilibrium flow](#); [flow distribution](#); [pressure drop](#); [Taylor bubble velocity](#); [void fraction distribution](#)

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