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Phase Detection aided Thermometry for Two-Phase Flow MAO TAKEYAMA, TOMOAKI KUNUGI, ZENSAKU KAWARA, TAKEHIKO YOKOMINE, Kyoto University — Since temperature and void fraction (or phase fraction) are important parameters to characterize and grasp multiphase flow behaviors, various methods have been developed and applied to. However, these multiphase flow parameters cannot be measured at the same time and position because they need the individual sensor. A new thermometry to detect the phase for two-phase flow and simultaneously measure the liquid/gas temperature with a miniature thermocouple with high temporal-spatial resolutions is developed; this method was named as a phase detection aided thermometry (PDaT). The principle of PDaT is that a miniature ( $\varphi 25\mu m$ ) thermocouple with 10 kHz of the sampling rate is used not only as a thermometer with the high temporal-spatial resolution, but also as an electrical conductance probe as a phase detector. The results of the proof of principle experiments will be presented.

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