experiment is consistent, however, and gives credence to the measurements.

The theoretical locations of the Wilson Points are indicated by the dashed lines on the figures. It is interesting to note that only slight pressure rises are created in the immediate downstream region. This indicates that, unlike near one-dimensional flows, two-dimensional flowfields tend to be capable of absorbing the heat release due to condensation without abrupt changes in the pressure and other flow variables.

Conclusions

By using a simple curved duct with low expansion rate, it has been possible to create a two-dimensional flowfield for wet steam and to obtain marked variations in pressure and mean droplet radius across the passage. Theoretical predictions using a numerical 'time-marching' technique show good agreement with the experimental results.

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References

1. **Young J. B. and Bakhtar F.** A comparison between theoretical calculation and experimental measurements of droplet sizes in nucleating steam flows, *Prace Inst. Maszyn Przeplywowych, 1976,* **70–72**, *259*
2. **Young J. B.** The spontaneous condensation of steam in supersonic nozzles physico-chemical hydrodynamics, *1982,* **3**, *57*
3. **Bratos M. and Jaeschke M.** Two-Dimensional Flows with Non-Equilibrium Phase Transition, *Inst. Podstawowych Problemow Techniki (IPPT), PAN, 1974*
4. **Kròl T.** Results of optical measurements of diameters of drops formed due to condensation of steam in a de Laval nozzle, *Prace Inst. Maszyn Przeplywowych, 1971* **57**
5. **Moheban M.** A fast time-marching method for non-equilibrium wet steam flows in turbines, *PhD Thesis, University of Cambridge Engineering Dept., 1984*
6. **Walters P. T.** Optical measurement of water drops in wet steam flows, *Inst. Mech. Eng. Conf. Publ., 'Wet Steam 4', Paper C32/73, Warwick, 1973*
7. **Wyler J. S. and Desai K. H.** Moisture measurement in a low pressure turbine using a laser light scattering probe, *Trans. ASME, J. Engng. for Power, 1978,* **110**, *554*
8. **La Mer V. K. and Barnes M. D.** Monodispersed hydraulic colloidal dispersion and light scattering properties, *J. Colloidal Sci., 1945, Pt. 1, 71, Pt. 2, 79*
9. **Denton J. D.** An improved time-marching method for turbo-machinery flow calculation, *Trans. ASME, J. Engng. for Power, 1983,* **105**, *514*
10. **Moheban M. and Young J. B.** A time-marching method for the calculation of blade-to-blade non-equilibrium wet steam flows in turbine cascades, *Inst. Mech. Eng., Conf. Publ., 'Computational Methods for Turbomachinery', Paper C76/84, Birmingham, 1984*

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