Corrections for Pipe Flows

Before leaving this discussion of the use of drift flux methods in steady flow, we note that, in many practical applications, the vertical flows under consideration are contained in a pipe. Consequently, instead of being invariant in the horizontal direction as assumed above, the flows may involve significant void fraction and velocity profiles over the pipe cross-section. Therefore, the linear relation, equation (Nqb1), used in the simple drift flux method to find the operating point, must be corrected to account for these profile variations. As described in section (Ndd), Zuber and Findlay (1965) developed corrections using the profile parameter, C_0 (equation (Ndd1)), and suggest that in these circumstances equation (Nqb1) should be replaced by

$$\overline{j_{AB}} = [1 - C_0\overline{\alpha}]\overline{j_A} - C_0\overline{\alpha}\overline{j_B} \tag{Nqf1}$$

where the overbar represents an average over the cross-section of the pipe.