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Apêndice A1

O mapa de padrão de escoamento vertical foi construído para as duas configurações analisadas neste trabalho de acordo com o procedimento de Crowe (2005). Os respectivos mapas encontram-se ilustrados na Fig. 5.5.

A transição entre os padrões de bolha dispersa e padrão intermitente foi determinada de acordo com a seguinte procedimento: dado um par de velocidades superficiais U_{sL}, U_{sG}, determina-se a fração de gás α_G, considerando escoamento de bolha disperso, de acordo com.

$$\alpha_G = \frac{U_{sG}}{U_G} \qquad \text{(A.1)}$$

onde a velocidade do gás deve ser obtida utilizando a seguinte equação de deslizamento

$$U_G = C_o U_m + u_b \quad ; \quad U_m = U_{sG} + U_{sL} \quad , \quad C_o = 1.25 \qquad \text{(A.2)}$$

sendo a velocidade de deslizamento determinada a partir de

$$u_b = 1{,}53 \left(\frac{\sigma g (\rho_L - \rho_G)}{{\rho_L}^2} \right)^{\frac{1}{4}} sen(\beta) \qquad \text{(A.3)}$$

Se o valor de $\alpha_G \leq 0{,}25$ ($\alpha_L < 0{,}75$) o padrão de escoamento considerado é bolha dispersa.

A transição entre o padrão anular – intermitente é obtida quando a fração de líquido de equilíbrio para um par de velocidades superficiais de um escoamento permamente anular é $\alpha_L \leq 0{,}35$. Para determinar a fração de líquido de equilíbrio é necessário resolver a Eq. (3.74), tendo sido utilizado o método da bisseção.

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