The path metric update formula from [1][1] is

$$PM_k^{(i)} = PM_k^{(i-1)} + \ln\left(1 + e^{-(1-2u)\lambda}\right)$$

where k is the path index, i is the bit index, $u = \hat{u}_i[k]$, and

$$\lambda = L_0^{(i)}[k]$$

which is the decision LLR at the leftmost stage.

For $x \geq 0$, the function $\ln(1 + e^{-x})$ can be approximated using the table in [2][2]. Else, to handle positive exponents, we have

$$\ln(1 + e^{x}) = \ln(e^{x}) + \ln(1 + e^{-x}) = x + \ln(1 + e^{-x}) = x + (\text{table approximation}).$$

[1] A. Balatsoukas-Stimming, M. B. Parizi and A. Burg, ”LLR-Based Successive Cancellation List Decoding of Polar Codes”

[2] Xiao-Yu Hu, E. Eleftheriou, D. . -M. Arnold and A. Dholakia, "Efficient implementations of the sum-product algorithm for decoding LDPC codes"