



$$H_{p,q}^{m,n}(z) = \sum_{i=1}^n \sum_{k=0}^{\infty} \text{Res}_{s=a_{ik}} [\mathcal{H}_{p,q}^{m,n}(s) z^{-s}] \quad H_{p,q}^{m,n}(z) = \sum_{j=1}^m \sum_{\ell=0}^{\infty} \text{Res}_{s=b_{j\ell}} [\mathcal{H}_{p,q}^{m,n}(s) z^{-s}]$$