Matrix vector products of the coefficients of the conformal welding maps

The Conformal Welding Theorem states that, given a quasi-symmetry \( \phi \) on the unit circle, there exists a unique pair of quasiconformally extendible, one-to-one and holomorphic maps \( F \) and \( G \) satisfying \( G^{-1} \circ F = \phi \). We first introduce power matrices, matrix representations for formal power series at 0 and at \( \infty \). Analyzing the block structure of these representations, we demonstrate that the coefficients of \( F \) and \( G \) can be determined using convergent matrix operations in the case when \( \phi \) is analytic on an annulus.