1138-13-7 **Pedro de Carvalho Cayres Pinto**, **Hans-Christian Herbig**, **Daniel Herden** and **Christopher Seaton*** (seatonc@rhodes.edu), 2000 N. Parkway, Department of Mathematics and Computer Scienc, Memphis, TN 38112. *The Hilbert series of a reducible representation of* $\mathrm{SL}_2(\mathbb{C})$ *and its Laurent coefficients.*

Let $G = \mathrm{SL}_2(\mathbb{C})$, and let $V = \oplus_{k=1}^{r} V_{d_k}$ be a finite-dimensional representation of G where V_{d_k} denotes the unique irreducible representation of G of dimension $d_k + 1$ on binary forms of degree d_k. Let $\mathbb{C}[V]^G$ denote the graded algebra of polynomial G-invariants. Let $H_V(t)$ denote the Hilbert series of $\mathbb{C}[V]^G$, the generating function of the dimensions of the homogeneous components of $\mathbb{C}[V]^G$. It is well-known that $H_V(t)$ is a rational function with a pole at $t = 1$ of order $\dim \mathbb{C}[V]^G$. The lowest-degree coefficient $\gamma_0(V)$ of the Laurent series of $H_V(t)$ at $t = 1$ is sometimes called the *degree* of $\mathbb{C}[V]^G$.

When $r = 1$, i.e. $V = V_d$ is irreducible, a formula for $\gamma_0(V)$ was given by Hilbert, and several authors have developed algorithms to compute $H_V(t)$. We will present recent results for the case of an arbitrary finite-dimensional representation, including a general formula for the Hilbert series expressed as averages of rational functions over roots of unity, a corresponding algorithm to compute $H_V(t)$, and a closed formula for $\gamma_0(V)$ in terms of Schur polynomials of the weights. (Received November 03, 2017)