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Jennifer R Daniel* (jennifer.daniel@lamar.edu), Lamar University, Department of Mathematics, Campus Box 10047, Beaumont, TX 77710, and **Daniel J Gagliardi** (gagliardid@canton.edu), 328 Faculty Office Building, 37 Cornell Drive, Canton, NY 13617.

Algorithms for computing characters of real reductive symmetric spaces.

Gagliardi and Helminck gave a complete set of algorithms to compute the characters of Riemannian symmetric spaces. In this work we extend these results to general real reductive symmetric spaces. The fine structure of these symmetric spaces can be obtained from a complex reductive Lie group with a pair of commuting involutions, σ and θ. The actions of σ and θ are represented graphically by a (σ, θ)- diagram. Implicit in each diagram is four root systems $\Phi(\mathfrak{a})$, $\Phi(\mathfrak{a}_1)$, $\Phi(\mathfrak{a}_2)$, and $\Phi(\mathfrak{t})$. The weight lattices associated with these root systems are denoted by $\Lambda_{\mathfrak{t}}$, $\Lambda_{\mathfrak{a}}$, $\Lambda_{\mathfrak{a}_1}$, and $\Lambda_{\mathfrak{a}_2}$, respectively. The natural projection maps π, π_1, and π_2 extend linearly to the associated weight lattices. Gagliardi and Helminck showed that $\pi_1(\Lambda_{\mathfrak{t}}) = \Lambda_{\mathfrak{a}_1}$ and $\pi_2(\Lambda_{\mathfrak{t}}) = \Lambda_{\mathfrak{a}_2}$. In this work, we extend these results to show that $\pi(\Lambda_{\mathfrak{t}}) = \pi_2|_{\mathfrak{a}_1}(\pi_1(\Lambda_{\mathfrak{t}})) = \pi_1|_{\mathfrak{a}_2}(\pi_2(\Lambda_{\mathfrak{t}})) = \Lambda_{\mathfrak{a}}$. (Received February 09, 2009)