Combinatorial Construction of Tangent Vector Fields on Spheres

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Abstract—For every odd n, on the sphere S^n, $\rho(n) - 1$ linear orthonormal tangent vector fields, where $\rho(n)$ is the Hurwitz–Radon number, are explicitly constructed. For each 8×8 sign matrix, compositions for infinite-dimensional positive definite quadratic forms are explicitly constructed. The infinite-dimensional real normed algebras thus arising are proved to have certain properties of associativity and divisibility type.

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