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Transitive conformal holonomy groups

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For $(M,[g])$ a conformal manifold of signature (p,q) and dimension at least three, the conformal holonomy group $\mathrm{Hol}(M,[g]) \subset O(p+1,q+1)$ is an invariant induced by the canonical Cartan geometry of $(M,[g])$. We give a description of all possible connected conformal holonomy groups which act transitively on the M\"obius sphere $S^{p,q}$, the homogeneous model space for conformal structures of signature (p,q). The main part of this description is a list of all such groups which also act irreducibly on $\R^{p+1,q+1}$. For the rest, we show that they must be compact and act decomposably on $\R^{p+1,q+1}$, in particular, by known facts about conformal holonomy the conformal class $[g]$ must contain a metric which is locally isometric to a so-called special Einstein product.

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