

## Splitting fields of complex hyperbolic groups

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### Abstract

We show that if  $\Gamma$  is a totally irreducible subgroup of  $SU(n, 1)$ , then  $\Gamma$  contains a loxodromic element  $A$  with all its eigenvalues distinct. Then we prove that  $\Gamma$  is conjugate in  $SU(n, 1)$  to a subgroup of  $SU(n, 1, \mathbb{Q}(\Gamma, A))$ , where  $\mathbb{Q}(\Gamma, A)$  is the field generated by the trace field  $\mathbb{Q}(\Gamma)$  of  $\Gamma$  and all the eigenvalues of  $A$ . In other words,  $\mathbb{Q}(\Gamma, A)$  is a splitting field of  $\Gamma$ . It follows from this that if  $\Gamma$  is a complex irreducible subgroup of  $SU(n, 1)$  such that the spectra of all the loxodromic elements of  $\Gamma$  are real, then  $\Gamma$  is conjugate in  $SU(n, 1)$  to a subgroup of  $SO(n, 1)$ .

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