

## The Tits alternative for the automorphism group of a free product

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**Abstract:** A group  $G$  is said to satisfy the Tits alternative if every subgroup of  $G$  either contains a nonabelian free subgroup, or is virtually solvable. The talk will aim at presenting a version of this alternative for the automorphism group of a free product of groups. A classical theorem of Grushko states that every finitely generated group  $G$  splits as a free product of the form  $G = G_1 \times \dots \times G_k \times F_N$ , where  $F_N$  is a finitely generated free group, and the  $G_i$ 's are nontrivial, not isomorphic to  $\mathbb{Z}$ , and freely indecomposable. I prove that if all groups  $G_i$  and  $Out(G_i)$  satisfy the Tits alternative, then so does the group  $Out(G)$  of outer automorphisms of  $G$ . I will present some applications of this theorem, especially to the case where  $G$  is a right-angled Artin group. I will then present a proof, in parallel to a new proof of the Tits alternative for mapping class groups of surfaces. This relies on a study of the actions of some subgroups of  $Out(G)$  on a version of the outer space for free products, and on a hyperbolic simplicial graph.