



Doctoral Thesis

## Groups of tree-automorphisms and their unitary representations

**Author(s):**

Amann, Olivier Éric

**Publication Date:**

2003

**Permanent Link:**

<https://doi.org/10.3929/ethz-a-004621416> →

**Rights / License:**

[In Copyright - Non-Commercial Use Permitted](#) →

This page was generated automatically upon download from the [ETH Zurich Research Collection](#). For more information please consult the [Terms of use](#).

Diss. ETH No. 15 292

# Groups of Tree-Automorphisms and their Unitary Representations

A dissertation submitted to the  
SWISS FEDERAL INSTITUTE OF TECHNOLOGY  
ZURICH

for the degree of  
Doctor of Mathematics

presented by  
Olivier Éric Amann  
Dipl. Math., Université de Lausanne  
born September 23, 1967  
citizen of Geneva (GE)

accepted on the recommendation of  
Prof. Dr. Marc Burger, examiner  
Prof. Dr. Pierre De la Harpe, co-examiner

2003

# Abstract

## English

In this work, we introduce a property for automorphism groups of locally finite trees, which we call the Independence Property and which, for closed groups, is equivalent to Property ( $P$ ) introduced in [Tits]. Using this, we proceed to the classification of all continuous unitary irreducible representations of closed non compact locally 2-transitive (cf. [B; M]) automorphism groups of locally finite homogeneous or semi-homogeneous trees which have the Independence Property. Further we treat the case of the locally finite homogeneous tree where we show that all closed edge transitive automorphism groups which have the Independence Property are locally transitive Universal Groups (cf. [B; M]). At last we give two necessary and sufficient conditions for a locally transitive Universal Group to be topologically finitely generated (cf. [Mozes]).

## Deutsch

In dieser Arbeit führen wir die "unabhängigkeits Eigenschaft" (Independence Property) für Automorphismengruppen von lokal endlichen Bäumen ein, die, falls die Automorphismengruppe geschlossen ist, äquivalent zur Eigenschaft ( $P$ ) in [Tits] ist. Ferner geben wir eine Klassifizierung sämtlicher stetiger unitärer irreduktibler Darstellungen von geschlossenen nicht kompakten lokal 2-transitiven (s. [B; M]) Automorphismengruppen mit unabhängigkeits Eigenschaft von lokal endlichen homogenen oder semi-homogenen Bäumen. Den Fall der lokal endlichen homogenen Bäumen behandelnd, zeigen wir, dass alle geschlossenen Automorphismengruppen mit unabhängigkeits Eigenschaft und transitiver Aktion auf den Kanten des Baumes lokal transitive Universal-Gruppen (s. [B; M]) sind. Wir geben auch für lokal transitive Universal-Gruppen zwei äquivalente Bedingungen um topologisch endlich erzeugt zu sein (s. [Mozes]).