Almost amalgamated profinite groups

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Abstract : Bass-Serre theory was initiated in the 1970 by J.P Serre and aims to characterize the properties of certain groups (freedom or the fact of being an amalgam of groups) by making them act on trees. One of the fundamental results of this theory states that a group is free if and only if it acts freely on a tree.

In 2011, B. Deschamps and I. Suarez introduced a profinite version of this result and lay the foundations of a profinite Bass-Serre theory. More precisely they have been interested in an analogue for profinite groups of this following Serre's result : an abstract group is free if and only if it acts freely on a tree.

In this talk we will first introduce Deschamp-Suarez prographs theory, then we will prove a profinite analogue of Serre's combinatorial caracterisation of amalgamted groups. This lead us to consider the notion of almost amalgamated profinite groups i.e. which contain a dense amalgamated abstract subgroup. We will finish with an illustration of this result in Galois theory : we will describe the absolute Galois group of $\mathbb{R}((t))$ (isomorphic to $\widehat{D_{p^\infty}} = \mathbb{Z}_p \rtimes \mathbb{Z}/2\mathbb{Z}$) by using the arithmetic of this field.