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LIMIT GROUPS OVER COHERENT RIGHT-ANGLED ARTIN GROUPS

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Abstract: A new class of groups $\mathcal{C}$, containing all coherent RAAGs and all toral relatively hyperbolic groups, is defined. It is shown that, for a group G in the class $\mathcal{C}$, the $\mathbb{Z}[t]$-exponential group $G^{\mathbb{Z}[t]}$ may be constructed as an iterated centraliser extension. Using this fact, it is proved that $G^{\mathbb{Z}[t]}$ is fully residually G (i.e. it has the same universal theory as G) and so its finitely generated subgroups are limit groups over G. If $\mathbb{G}$ is a coherent RAAG, then the converse also holds – any limit group over $\mathbb{G}$ embeds into $\mathbb{G}^{\mathbb{Z}[t]}$. Moreover, it is proved that limit groups over $\mathbb{G}$ are finitely presented, coherent and CAT(0), so in particular have solvable word and conjugacy problems.

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