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Auslander–Reiten theory for the representations over an infinite quiver

Let Q be an infinite quiver which is locally finite and such that the number of paths between two given vertices is finite. We study the Auslander–Reiten theory of the category $\mathrm{rep}(Q)$ of the locally finite dimensional representations over a field k. Let $\mathrm{rep}^+(Q)$ be the representations of $\mathrm{rep}(Q)$ which are finitely presented. With the additional condition that Q has no left infinite paths, we describe the components of the Auslander–Reiten quiver of $\mathrm{rep}^+(Q)$. We find that all regular components are of shape $\mathbb{Z}\mathbb{A}_\infty$ or $\mathbb{N}^-\mathbb{A}_\infty$. The number of these components is finite if and only if Q is of infinite Dynkin type. We also give a condition on Q for when all regular components are of shape $\mathbb{N}^-\mathbb{A}_\infty$.