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Highlights:

- Ce-Ce pairs are nearly equally stiff in $\text{Ce}_{55}\text{Al}_{45}$ and $\text{Ce}_{75}\text{Al}_{25}$ metallic glasses
- Ce-Al pairs are significantly more stiff in $\text{Ce}_{75}\text{Al}_{25}$ than in $\text{Ce}_{55}\text{Al}_{45}$
- On compression, Al/Ce size mismatch decreases in $\text{Ce}_{75}\text{Al}_{25}$ and increases in $\text{Ce}_{55}\text{Al}_{45}$
- Devitrification of $\text{Ce}_{75}\text{Al}_{25}$ results from a topological instability of the glass