Quotient groups of IA-automorphisms of free metabelian groups

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For a group G and a positive integer c, we write $\gamma_c(G)$ for the c-th term of the lower central series of G. For a positive integer n, with $n \geq 2$, let M_n be a free metabelian group of rank n. For $c \geq 2$, let $\mathrm{I}_c\mathrm{A}(M_n)$ be the subgroup of $\mathrm{Aut}(M_n)$ consisting of all automorphisms which induce the identity mapping on $M_n/\gamma_c(M_n)$. Our aim in this talk is to study the quotient groups $\mathcal{L}^c(\mathrm{IA}(M_n)) = \mathrm{I}_c\mathrm{A}(M_n)/\mathrm{I}_{c+1}\mathrm{A}(M_n)$ for all n and c. For $c \geq 2$, we show $\mathrm{I}_c\mathrm{A}(M_2)) = \gamma_{c-1}(\mathrm{IA}(M_2))$. For $n = 3$, we show $\gamma_3(\mathrm{IA}(M_3)) \neq \mathrm{I}_4\mathrm{A}(M_3)$ and so, the Andreadakis' conjecture (for a free metabelian group of rank 3) is not valid for $n = 3$ and $c = 3$. For $n, c \geq 4$, we prove that $\mathcal{L}^c(\mathrm{IA}(M_n)) = \gamma_{c-1}(\mathrm{IA}(M_n))\mathrm{I}_{c+1}\mathrm{A}(M_n)/\mathrm{I}_{c+1}\mathrm{A}(M_n)$.