Quotient groups of IA-automorphisms of free metabelian groups of finite rank

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For a positive integer n, with $n \geq 2$, let $G_n = F_n/F_n''$ be the free metabelian group of rank n. Furthermore, for a positive integer c, with $c \geq 2$, we write $G_{n,c} = G_n/\gamma_c(G_n)$, that is, a free metabelian and nilpotent group of rank n and class $c-1$. The natural epimorphism from G_n onto $G_{n,c}$ induces a group homomorphism $\pi_{n,c}$ from $\mathrm{Aut}(G_n)$ into $\mathrm{Aut}(G_{n,c})$. Write $\mathrm{I}_c\mathrm{A}(G_n)$ for the kernel of $\pi_{n,c}$ and $\mathrm{IA}(G_n) = \mathrm{I}_2\mathrm{A}(G_n)$. The following descending normal series of $\mathrm{Aut}(G_n)$

$$\mathrm{IA}(G_n) = \mathrm{I}_2\mathrm{A}(G_n) \supset \mathrm{I}_3\mathrm{A}(G_n) \supset \cdots$$

is central. Since G_n is residually nilpotent, we have $\bigcap_{c\geq 2} \mathrm{I}_c\mathrm{A}(G_n) = \{1\}$. Hence, $\mathrm{IA}(G_n)$ is residually nilpotent. For $c \geq 2$, we let $\mathcal{L}^c(\mathrm{IA}(G_n)) = \mathrm{I}_c\mathrm{A}(G_n)/\mathrm{I}_{c+1}\mathrm{A}(G_n)$. Our aim in this talk is to discuss some problems on the quotient groups $\mathcal{L}^c(\mathrm{IA}(G_n))$ for all $c \geq 2$.