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Abstracts of Short Communications and Posters

Section:

7. Lie Groups and Lie Algebras

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On subalgebras of free Lie Algebras
Let X be a set with the weight function $\mathrm{wt} : X \to \mathbf{N}$ such that there exists the series $\mathcal{H}(X,t) = \sum_{i=1}^{\infty} |X_i| t^i$, $X_i = \{x \in X \,|\, \mathrm{wt}\, x = i\}$. Let L be the free Lie algebra generated by X. All series for sets and spaces are defined with respect to this weight function in the conventional way. Let $\mathcal{E}$ be the operator on power series $\mathcal{E}(\sum_{n=1}^{\infty} b_n t^n) = \prod_{n=1}^{\infty} (1-t^n)^{-b_n}$. The following is the analogue of Schreier's formula for free groups.
Theorem. Suppose that $H \subset L$ is a subalgebra with a free generating set Y. Then $\mathcal{H}(Y,t) - 1 = (\mathcal{H}(X,t) - 1) \cdot \mathcal{E}(\mathcal{H}(L/H,t))$.
There is a version for exponential generating functions. Their apllications will be presented.