



CENTRO DE
MATEMÁTICA
UNIVERSIDADE DO PORTO

Algebra, Combinatorics and Number Theory Seminar

Date. Tuesday, December 13, 2022 - 4.30pm

Speaker. Mykola Khrypchenko - CMUP

Title. Transposed Poisson structures on block and Witt type Lie algebras

Abstract.

A *transposed Poisson algebra* [1] is a triple $(\mathcal{L}, \cdot, [\cdot, \cdot])$ consisting of a vector space \mathcal{L} with two bilinear operations \cdot and $[\cdot, \cdot]$, such that

1. (\mathcal{L}, \cdot) is a commutative associative algebra;
2. $(\mathcal{L}, [\cdot, \cdot])$ is a Lie algebra;
3. the “*transposed*” *Leibniz law* holds: $2z \cdot [x, y] = [z \cdot x, y] + [x, z \cdot y]$ for all $x, y, z \in \mathcal{L}$.

A *transposed Poisson algebra structure* on a Lie algebra $(\mathcal{L}, [\cdot, \cdot])$ is a (commutative associative) multiplication \cdot on \mathcal{L} such that $(\mathcal{L}, \cdot, [\cdot, \cdot])$ is a transposed Poisson algebra.

In this talk we will present results based on two joint works [2, 3] with Ivan Kaygorodov (Universidade da Beira Interior). In [2] we describe transposed Poisson algebra structures on Block Lie algebras $\mathcal{B}(q)$ and Block Lie superalgebras $\mathcal{S}(q)$, where q is an arbitrary complex number. In [3] we solve the same problem for Witt type algebras $V(f)$.

References

- [1] Bai, C., Bai, R., Guo, L., and Wu, Y. Transposed Poisson algebras, Novikov-Poisson algebras, and 3-Lie algebras. arXiv:2005.01110 (2020).
- [2] Kaygorodov, I., and Khrypchenko, M. Transposed Poisson structures on Block Lie algebras and superalgebras. *Linear Algebra Appl.* **656** (2023), 167–197.
- [3] Kaygorodov, I., and Khrypchenko, M. M. Transposed Poisson structures on Witt type algebras. arXiv:2210.00217 (2022).