A Class of Functionals on the Sequence Space s Satisfying the Palais-Smale Condition

Kaveh Eftekharinasab
(Institutue of Mathematics of National Academy of Sciences of UKraine)
E-mail: kaveh@imath.kiev.ua

In this talk, we introduce a class of functionals on the space of rapidly decreasing sequences s, called $\mathcal{F}_s$-functionals, defined as decomposable sums of quadratic and convex terms with quadratic growth. We prove that such functionals satisfy the Palais–Smale condition and admit a unique global minimum. Furthermore, we show that the Palais–Smale condition is preserved under linear homeomorphisms. This allows us to construct corresponding functionals satisfying the Palais–Smale condition on Fréchet spaces isomorphic to the space s. We then show how this framework provides a tool for the formulation and proof of existence and uniqueness of solutions for specific nonlinear operator problems in function spaces.

References

[1] Kaveh Eftekharinasab. A Class of Functionals on the Sequence Space s Satisfying the Palais-Smale Condition. *arXiv:2510.10146 [math.FA]* , 2025. https://doi.org/10.48550/arXiv.2510.10146.