

ICRAMCS 2026

THE EIGHTH EDITION OF THE INTERNATIONAL CONFERENCE ON
RESEARCH IN APPLIED MATHEMATICS AND COMPUTER SCIENCE

April 23-24-25, 2026 | Marrakech, Morocco



Sequential hypercyclicity of composition operators on $A(\mathbb{R})$

Communication Info

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Keywords:

(1) composition operators

(2) real analytic functions

(3) sequential hypercyclicity

Abstract

We investigate the dynamical behaviour of composition operators on the space $A(\mathbb{R})$ of real analytic functions endowed with its natural locally convex topology. Focusing on the exponential symbol $\varphi(x)=e^x$, we show that the associated composition operator C_φ is not hypercyclic, despite being topologically transitive. On the other hand, we prove that C_φ is sequentially hypercyclic. The proof relies on a refined approximation scheme for real analytic functions on separated compact sets and exploits the fast escape of the exponential iterates. This provides a natural example of a composition operator on $A(\mathbb{R})$ which is sequentially hypercyclic but not hypercyclic, thereby complementing and extending previous results of Bonet and Domański.

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