

# Shift operators on Banach spaces

MARIA PIRES DE CARVALHO\*

CMUP and Departamento de Matemática, Faculdade de Ciências da Universidade do Porto,  
Rua do Campo Alegre s/n, 4169-007 Porto, Portugal  
`mpcarval@fc.up.pt`

This talk is about linear dynamics in infinite dimensional Banach spaces. Suppose one takes a sequence of bidimensional matrices and, at each vector in  $\ell_p(\mathbb{R}^2)$ , applies the matrices coordinatewise and then shifts the resulting sequence. What is the expected dynamics of such a linear operator in  $\ell_p(\mathbb{R}^2)$ ? Is it hyperbolic? Has it non-trivial recurrence? Does it satisfy the shadowing property? I will present a recent joint work with Udayan Darji and Paulo Varandas where we address these and analogous questions for a new family of linear bounded invertible maps, which we call *shift operators*. This family comprises weighted backward shifts and (up to linear conjugation) finite products of weighted shifts and dissipative composition operators. I will illustrate the variety of dynamical properties this family exhibits, explain how we classify a large class of these shift operators and prove that, for them, generalized hyperbolicity is equivalent to shadowing.

---

\*This is joint work with Udayan Darji (University of Louisville, USA) and Paulo Varandas (Federal University of Bahia, Brazil).