PIMS / AMI Seminar

Friday, October 27, 2017
3:00 p.m.
CAB 657

"The simplified topological epsilon-algorithms and their applications"

Michela Redivo-Zaglia
Università degli Studi di Padova, Italia
Joint work with
Claude Brezinski
Université de Lille - Sciences et Techniques, France

Abstract

Shanks scalar sequence transformation (Shanks, 1949, 1955) and the corresponding ε-algorithm (Wynn, 1956) for its recursive implementation are well-known convergence acceleration methods. They were generalized to be able to treat sequences of elements of a general vector space E (Brezinski, 1975). The rules of this *topological ε-algorithm* are quite complicated and difficult to implement since elements of E^*, the algebraic dual space of E, recursively intervene in them. Recently, these rules were greatly simplified, thus leading to *the simplified topological ε-algorithm* (C.B., M.R.-Z., 2014). First, we will show how its recursive rule was derived from the old rules. Then, this new algorithm and its implementation will be discussed. We will see the simplification it brought in terms of arithmetical operations and storage. The use of the freely available corresponding software will be described (C.B., M.R.--Z., 2017). This algorithm will then be applied to the solution of systems of linear and nonlinear equations, the computation of matrix functions, and the solution of Fredholm integral equations of the second kind (C.B., M.R.--Z., 2017).

Refreshments will be served in CAB 649 at 2:30 p.m.