

## References related to the content of the Lectures by Stefano Serra Capizzano at the Moscow-Rome School-2016

### References: Locally Toeplitz, GLT, GLT and Finite Differences

- GARONI C., SERRA-CAPIZZANO S. *Generalized locally Toeplitz sequences: a review and an extension*. Technical Report 2015-016, Department of Information Technology, Uppsala University, Sweden (2015)  
<http://www.it.uu.se/research/publications/reports/2015-016/> To appear as Springer Monograph.
- SERRA-CAPIZZANO S. *Generalized locally Toeplitz sequences: spectral analysis and applications to discretized partial differential equations*. *Linear Algebra Appl.* **366** (2003) 371–402.
- SERRA-CAPIZZANO S. *The GLT class as a generalized Fourier Analysis and applications*. *Linear Algebra Appl.* **419** (2006) 180–233.
- TILLI P. *Locally Toeplitz sequences: spectral properties and applications*. *Linear Algebra Appl.* **278** (1998) 91–120.

### References: a.c.s. and further tools for identifying the symbol

- GARONI C., SERRA-CAPIZZANO S., SESANA D. *Tools for the asymptotic spectrum of non-Hermitian perturbations of Hermitian matrix-sequences and applications*. *Integral Eq. Oper. Theory* (2014) 10.1007/s00020-014-2157-6.
- GARONI C., SERRA-CAPIZZANO S., VASSALOS P. *A general tool for determining the asymptotic spectral distribution of Hermitian matrix-sequences*. *Oper. Matrices*, **9-3** (2015) 549–561r.
- SERRA-CAPIZZANO S. *Distribution results on the algebra generated by Toeplitz sequences: a finite dimensional approach*. *Linear Algebra Appl.* **328** (2001) 121–130.
- SERRA-CAPIZZANO S. *Spectral behaviour of matrix sequences and discretized boundary value problems*. *Linear Algebra Appl.* **337-1/3** (2001) 37–78.
- SERRA-CAPIZZANO S. *More inequalities and asymptotics for matrix valued linear positive operators: the noncommutative case*. *Oper. Theory Adv. Appl.* **135** (2002) 293–315.
- SERRA-CAPIZZANO S., SESANA D. *Approximating class of sequences: the Hermitian case*. *Linear Algebra Appl.* **434** (2011) 1163–1170.

### References: GLT and Finite Elements

- BECKERMANN B., SERRA-CAPIZZANO S. *On the asymptotic spectrum of Finite Element matrix sequences*. SIAM J. Numer. Anal. **45** (2007) 746–769.
- GARONI C., SERRA-CAPIZZANO S., SESANA D. *Spectral analysis and spectral symbol of  $d$ -variate  $\mathbf{Q}_p$  Lagrangian FEM stiffness matrices*. SIAM J. Matrix Anal. Appl. **36-3** (2015) 1100–1128.
- DOROSTKAR A., NEYTCHEVA M., SERRA-CAPIZZANO S. *Spectral analysis of coupled PDEs and of their Schur complements via the notion of Generalized Locally Toeplitz sequences*. Comp. Meth. Appl. Mech. Eng. **309** (2016) 74–105.

### References: GLT and Isogeometric Analysis

- DONATELLI M., GARONI C., MANNI C., SERRA-CAPIZZANO S., SPELEERS H. *Robust and optimal multi-iterative techniques for IgA Galerkin linear systems*. Comp. Meth. Appl. Mech. Eng. **284** (2015) 230–264.
- DONATELLI M., GARONI C., MANNI C., SERRA-CAPIZZANO S., SPELEERS H. *Robust and optimal multi-iterative techniques for IgA collocation linear systems*. Comp. Meth. Appl. Mech. Eng. **284** (2015) 1120–1146.
- DONATELLI M., GARONI C., MANNI C., SERRA-CAPIZZANO S., SPELEERS H. *Spectral analysis and spectral symbol of matrices in isogeometric collocation methods*. Math. Comp. **85** (2016) 1639–1680
- GARONI C. *Structured matrices coming from PDE Approximation Theory: spectral analysis, spectral symbol and design of fast iterative solvers*. Ph.D. Thesis in Mathematics of Computation, University of Insubria, Como, Italy (2014) <http://hdl.handle.net/10277/568>
- GARONI C., MANNI C., PELOSI F., SERRA-CAPIZZANO S., SPELEERS H. *On the spectrum of stiffness matrices arising from isogeometric analysis applied to second order elliptic problems*, Numer. Math. **127-4** (2014) 751–799.
- GARONI C., MANNI C., SERRA-CAPIZZANO S., SESANA D., SPELEERS H. *Spectral analysis and spectral symbol of matrices in isogeometric Galerkin methods*. Math. Comp. (2016), in press.  
Technical Report 2015-005, Department of Information Technology, Uppsala University (2015)  
<http://www.it.uu.se/research/publications/reports/2015-005/>
- GARONI C., MANNI C., SERRA-CAPIZZANO S., SESANA D., SPELEERS H. *Lusin theorem, GLT sequences and matrix computations: an application to the spectral analysis of PDE discretization matrices*. J. Math. Analysis Appl. in press. Technical Report 2015-012, Department of Information Technology, Uppsala University (2015)  
<http://www.it.uu.se/research/publications/reports/2015-012/>

**References: GLT and integral equations, zeros of orthogonal polynomials**

- AL-FHAID A.S., SERRA-CAPIZZANO S., SESANA D., ULLAH M.Z. *Singular-value (and eigenvalue) distribution and Krylov preconditioning of sequences of sampling matrices approximating integral operators*. Numer. Linear Algebra Appl. **21-6** (2014) 722–743.
- FASINO D., SERRA-CAPIZZANO S. *From Toeplitz matrix sequences to zero distribution of orthogonal polynomials*. Contemp. Math. **323** (2003) 329–340.
- GOLINSKII L., SERRA-CAPIZZANO S. *The asymptotic properties of the spectrum of nonsymmetrically perturbed Jacobi matrix sequences*. J. Approx. Theory **144** (2007) 84–102.
- KUIJLAARS A., SERRA-CAPIZZANO S. *Asymptotic zero distribution of orthogonal polynomials with discontinuously varying recurrence coefficients*. J. Approx. Theory **113** (2001) 142–155.
- SALINELLI E., SERRA-CAPIZZANO S., SESANA D. *Eigenvalue-eigenvector structure of Schoenmakers-Coffey matrices via Toeplitz technology and applications*. Linear Algebra Appl. **491** (2016) 138–160.

**References: Multigrid for structured matrices and symbol**

- ARICÓ A., DONATELLI M., SERRA-CAPIZZANO, S. *V-cycle optimal convergence for certain (multilevel) structured linear systems*. SIAM J. Matrix Anal. Appl. **26-1** (2004) 186–214.
- FIORENTINO S., SERRA-CAPIZZANO, S. *Multigrid methods for symmetric positive definite block Toeplitz matrices with nonnegative generating functions*. SIAM J. Sci. Comput. **17-5** (1996) 1068–1081.
- DONATELLI M., MOLteni M., PENNATI V., SERRA-CAPIZZANO, S. *Multigrid methods for cubic spline solution of two points (and 2D) boundary value problems*. Appl. Numer. Math. **104** (2016) 15–29.
- DONATELLI M., SERRA-CAPIZZANO S. *On the regularizing power of multigrid-type algorithms*. SIAM J. Sci. Comput. **27-6** (2006) 2053–2076.
- SERRA-CAPIZZANO S. *Multi-iterative methods*. Computers Math. Appl. **26-4** (1993) 65–87.
- SERRA CAPIZZANO S. *Convergence analysis of two-grid methods for elliptic Toeplitz and PDEs matrix-sequences*. Numer. Math. **92-3** (2002) 433–465.

- SERRA CAPIZZANO S., TABLINO POSSIO C. *Multigrid methods for multilevel circulant matrices*. SIAM J. Sci. Comput. **26-1** (2004) 55–85.

**References: Preconditioning for structured matrices and symbol**

- BERTACCINI D., GOLUB G.H., SERRA CAPIZZANO S., TABLINO-POSSIO C. *Preconditioned HSS methods for the solution of non-Hermitian positive definite linear systems and applications to the discrete convection-diffusion equation*. Numer. Math. **99-3** (2005) 441–484.
- DI BENEDETTO F., ESTATICO C., SERRA CAPIZZANO S. *Superoptimal Preconditioned Conjugate Gradient Iteration for Image Deblurring*. SIAM J. Sci. Comput. **26-3** (2005) 1012–1035.
- DI BENEDETTO F., FIORENTINO G., SERRA-CAPIZZANO S. *C.G. Preconditioning for Toeplitz Matrices*. Computers Math. Appl. **25-6** (1993) 33–45.
- DI BENEDETTO F., SERRA CAPIZZANO S. *A unifying approach to abstract matrix algebra preconditioning*. Numer. Math. **82-1** (1999) 57–90.
- DONATELLI M., GARONI C., MAZZA M., SERRA CAPIZZANO S. *Spectral behavior of preconditioned non-Hermitian block Toeplitz matrices with matrix-valued symbols*. Appl. Math. Comput. **245** (2014) 158–173.
- DONATELLI M., GARONI C., MAZZA M., SERRA-CAPIZZANO S., SESANA D. *Preconditioned HSS method for large multilevel block Toeplitz linear systems via the notion of matrix-valued symbol*. Numer. Linear Algebra Appl. **1** (2015) 83–119.
- HUCKLE T., SERRA CAPIZZANO S., TABLINO POSSIO C. *Preconditioning strategies for Hermitian indefinite Toeplitz linear systems*. SIAM J. Sci. Comput. **25-5** (2004) 1633–1654.
- HUCKLE T., SERRA CAPIZZANO S., TABLINO POSSIO C. *Preconditioning strategies for non Hermitian Toeplitz linear systems*. Numer. Linear Algebra Appl. **12-2,3** (2005) 211–220
- NOUTSOS, D., SERRA CAPIZZANO, S., VASSALOS, P. *Matrix algebra preconditioners for multilevel Toeplitz systems do not insure optimal convergence rate*. Theoret. Comput. Sci. **315-2,3** (2004) 557–579.
- SERRA CAPIZZANO S. *Preconditioning strategies for asymptotically ill-conditioned block Toeplitz systems*. BIT **34-4** (1994) 579–594.
- SERRA CAPIZZANO S. *Preconditioning strategies for Hermitian Toeplitz systems with nondefinite generating functions*. SIAM J. Matrix Anal. Appl. **17-4** 1007–1019.
- SERRA CAPIZZANO S. *Asymptotic results on the spectra of block Toeplitz preconditioned matrices*. SIAM J. Matrix Anal. Appl. **20-1** (1998) 31–44.

- SERRA CAPIZZANO S. *Spectral and computational analysis of block Toeplitz matrices having nonnegative definite matrix-valued generating functions.* BIT **39-1** (1999) 152–175.
- SERRA CAPIZZANO S. *The rate of convergence of Toeplitz based PCG methods for second order nonlinear boundary value problems.* Numer. Math. **81-3**(1999) 461–495.
- SERRA CAPIZZANO S. *A Korovkin-type Theory for finite Toeplitz operators via matrix algebras.* Numer. Math. **82-1** (1999) 117–142.
- SERRA-CAPIZZANO S., TABLINO-POSSIO C. *Spectral and structural analysis of high precision Finite Difference matrices for Elliptic Operators.* Linear Algebra Appl. **293** (1999) 85–131.
- SERRA-CAPIZZANO S., TABLINO-POSSIO C. *Analysis of preconditioning strategies for collocation linear systems.* Linear Algebra Appl. **369** (2003) 41–75.
- SERRA-CAPIZZANO S., TYR TYSHNIKOV. *Analysis of preconditioning strategies for collocation linear systems.* SIAM J. Matrix Anal. Appl. **21-2** (1999) 431–439.

**References: extreme eigenvalues, singular values, conditioning and symbol**

- SERRA CAPIZZANO S. *On the extreme spectral properties of symmetric Toeplitz matrices generated by  $L^1$  functions with several global minima/maxima.* BIT **36-1** (1996) 135–142.
- SERRA CAPIZZANO S. *On the extreme eigenvalues of Hermitian (block) Toeplitz matrices.* Linear Algebra Appl. **270** (1998) 109–129.
- SERRA CAPIZZANO S., TILLI P. *Extreme singular values and eigenvalues of non Hermitian Toeplitz matrices.* J. Comput. Appl. Math. **108-1,2** (1999) 113–130.
- SERRA CAPIZZANO S. *How bad can positive definite Toeplitz matrices be?.* Numer. Funct. Anal.Optimiz. **21-1,2** (2000) 255–261.