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This volume offers researchers the opportunity to catch up with important developments in the field of numerical analysis and scientific computing and to get in touch with state-of-the-art numerical techniques.

The book has three parts. The first one is devoted to the use of wavelets to derive some new approaches in the numerical solution of PDEs, showing in particular how the possibility of writing equivalent norms for the scale of Besov spaces allows to develop some new methods. The second part provides an overview of the modern finite-volume and finite-difference shock-capturing schemes for systems of conservation and balance laws, with emphasis on providing a unified view of such schemes by identifying the essential aspects of their construction. In the last part a general introduction is given to the discontinuous Galerkin methods for solving some classes of PDEs, discussing cell entropy inequalities, nonlinear stability and error estimates.