

## On positive invertibility of operators in ordered Banach spaces

Martin R. Weber (TU Dresden)

TUE/110 11:00–11:20
------------------------

The positive invertibility of operators is studied in Banach spaces ordered by a normal cone with interior points. If there exists a uniformly positive functional then any positively invertible operator  $A$  possesses a decomposition  $A = U - V$  with  $U, V \geq 0$  and the properties: a)  $U^{-1}$  exists, b)  $VU^{-1} \geq 0$ , c)  $Ax \geq 0, Ux \geq 0$  imply  $x \geq 0$  and d) the spectral radius  $r(VU^{-1}) < 1$ . In an earlier paper [3] it was shown that the existence of such decompositions is sufficient for the positive invertibility of the operator  $A$ . The well known Peris' result [2] on the positive invertibility of matrices is obtained as a special case of the main theorem. The decomposition is demonstrated for a positively invertible operator in a Banach space ordered by an ice cream cone [1].

- [1] 1 YU. LYUBICH. Perron-Frobenius theory for Banach spaces with a hyperbolic cone. *Integral Equations and Operator Theory* **23**: 232 - 244, 1995.
- [2] 2 J.E. PERIS. A new characterization of inverse-positive matrices. *Linear Algebra Appl.* **154 - 155**: 45 - 58, 1991.
- [3] 3 M.R. WEBER. On the Positiveness of the Inverse Operator. *Math. Nachr.* **163**: 145 - 149, (1993), Erratum. *Math. Nachr.* **171**: 325 - 326, 1995.