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THE MATHEMATICAL WORK OF SUSANNE DIEROLF

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Dedicated to the memory of Susanne Dierolf

1. Introduction

In April 2009, Susanne Dierolf died at the age of 66 years. For almost 40 years she contributed an overwhelming amount of most original mathematical ideas mainly to the theory of topological vector spaces. The aim of this article, thus, cannot be to collect each single result due to Susanne Dierolf, and we will not even mention all of her publications, which, nevertheless, are all included in the bibliography. What we try to do is to present a selection of results and methods which we consider as her most important contributions to functional analysis and which are, according to our personal belief, typical for her highly original, creative, and accurate way of doing mathematics. Among these highlights are the definite solutions to four open problems posed by her "mathematical hero" A. Grothendieck and, though not quite explicit, the solution of a longstanding conjecture of V.A. Raĭkov in category theory.

Most of these and many more answers to questions from further mathematicians are "negative" and occasionally Susanne had been called "Mrs. Counterexample". However, as we will try to describe in this article, what one could call counterexample is very often an extremely clever existence theorem, which, by clarifying the reason for the failure of a too general conjecture, often triggered further research ending in "positive" applicable theorems.

The main area of Susanne Dierolf's mathematical work was the theory of topological or locally convex vector spaces (tvs and lcs, for short) with an emphasis on Fréchet spaces and their close relatives. We will thus concentrate on these topics neglecting her contributions to other branches of mathematics like general topology and, in particular, her work on topological groups culminating in the joint book [24] with W. Roelcke. This does of course not mean that we consider the latter less important but only that we do not feel competent to judge them properly.