JOURNAL OF
FUNCTION SPACES AND APPLICATIONS
Volume 3, Number 1 (2005), 33-71

http://www.jfsa.net

Continuity envelopes of spaces of generalised smoothness: a limiting case; embeddings and approximation numbers

António M. Caetano[*, †] **and Dorothee D. Haroske**[*]

(*Communicated by Hans Triebel*)

Mathematics Subject Classification. 46E35, 41A46, 47B06.

Keywords and phrases. Function spaces of generalized smoothness, continuity envelopes, sharp embeddings, approximation numbers.

Abstract. Continuity envelopes for the spaces of generalised smoothness $B_{pq}^{(s,\Psi)}(\mathbb{R}^n)$ and $F_{pq}^{(s,\Psi)}(\mathbb{R}^n)$ are studied in the so-called supercritical case $s = 1+n/p$, paralleling recent developments for a corresponding limiting case for local growth envelopes of spaces of such a type. In addition, the power of the concept is used in proving conditions for some embeddings between function spaces to hold, as well as in the study of the asymptotic behaviour of approximation numbers of related embeddings.

1. Introduction

This paper continues the study of continuity envelopes in spaces of generalised smoothness begun in [21]. Moreover, as we shall immediately explain, there also appear close connections to [6] as we concentrate on some

[*]The research was partially supported by the program 'Projektbezogener Personenaustausch mit Portugal – Acções Integradas Luso-Alemãs / DAAD-ICCTI'

[†]Also research was partially supported by Unidade de Investigação Matemática e Aplicações of Universidade de Aveiro through Programa Operacional 'Ciência, Tecnologia, Inovação' (POCTI) of the Fundação para a Ciência e a Tecnologia (FCT), cofinanced by the European Community fund FEDER.