ON SOBOLEV TYPE INEQUALITIES AND THEIR APPLICATIONS IN AXISYMMETRIC DOMAINS OF $\mathbb{R}^3$

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1. Introduction

The importance of the Sobolev type inequalities in the theory of partial differential equations is well–established, and over the years much effort has been devoted to the study of these inequalities, including the provision of necessary and sufficient conditions for them to hold. For more details of some of this work we refer to [3], [7], [9], [13], [15], [17],... In the present paper we deal with the weighted Sobolev inequalities in the context of the weighted Sobolev spaces $W_0^{1,p}(D,r)$ and the weighted Lebesgue spaces $L_r^p(D)$ where $W_0^{1,p}(D,r)$ (resp. $L_r^p(D)$) is the closure of $\mathcal{C}_0^\infty(D)$, the set of functions with compact support in D and having derivatives of any order, in the norm

$$u \to \left(\int_D |\nabla u|^p r\, dr\, dz\right)^{\frac{1}{p}} \quad \left(\text{resp. } \left(\int_D |u|^p r\, dr\, dz\right)^{\frac{1}{p}}\right),$$

$p > 1$ and D a domain of $\mathbb{R}^2$ which will be defined below.

The main result of this work is the following

Theorem 1.1. *Let $q > 4$. Then there exists $q_c = q_c(D) \in \overline{\mathbb{R}}$ such that*

$$W_0^{1,p}(D,r) \subset L_r^q(D), \quad \forall q < q_c.$$

WINDOWED FOURIER TRANSFORM FOR DISTRIBUTIONS

Ion Armeanu

Abstract. In this note we shall define a windowed Fourier transform for distributions and we shall obtain some properties of this.

ON THE EXISTENCE OF TWO SEQUENCES OF SOLUTIONS FOR A SUPERLINEAR STURM–LIOUVILLE BOUNDARY VALUE PROBLEM

A. Capietto
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Abstract. We prove the existence of two sequences of solutions for a Sturm–Liouville non–homogeneous boundary value problem associated to the equation

$$u''(t) + f(u(t)) = p(t, u(t), u'(t), u''(t))$$

where f is superlinear and p satisfies some growth condition in the last three variables. We use a Leray–Schauder alternative theorem in the framework of coincidence degree theory.

ORTHOLOGY, RADIAL ENLARGEMENT, AND HYPERBOLAS

Zvonko Čerin

Abstract. We obtain several characterizations of the Kiepert, Jarabek, and Feuerbach hyperbolas of a scalene triangle ABC using antipedal triangles of a variable point P in the plane and the notions of orthology and radial enlargement. Our arguments are algebraic and use complex numbers.

NONCHARACTERISTIC PHASE BOUNDARIES FOR GENERAL SYSTEMS OF CONSERVATION LAWS

Andrea Corli

Introduction

An interesting feature of many elastic materials is the possibility of undergoing different phases. An example is provided by the stretching of some solid polymer filament, [10], [16], where the phenomen is called necking: as the filament is extended, the cross–sectional area may change almost stepwise at some point, leaving the material thinner at one side than at the other. As the stretching goes on, the neck thus formed moves along the filament.

DUAL PROPERTIES IN TABLE ALGEBRAS

M.R. Darafsheh
A. Rahnamai Barghi

Abstract. In this paper we prove that if (A, B) and its dual $(A, \widehat{B})$ are both table algebras, then nilpotency property is preserved by duality. Using basic properties of table algebras we also prove that if (A, B) is an abelian table algebra, then $(A, \widehat{B})$ is also an abelian table algebra.

FUNDAMENTAL RELATION ON NON–ASSOCIATIVE HYPERGROUPOIDS

Renato Migliorato

Abstract. In this paper we study essentially β^*–relation on non–associative hypergdoupoids. Two characterizations of β^* and one characterization of $\overset{\cup}{\beta}{}^*$ are given in the general case and some particular case is studied (feeble associativity). A remarkable example is given by the class of the lateral hypergdoupoids.

NONLINEAR CONNECTIONS ON TANGENT BUNDLE AND HARMONICITY

C. Oniciuc

Abstract. The problems studied in this paper are concerned with the harmonicity of the canonical projection $\pi : TM \to M$, where (M, g) is a Riemannian space and TM is its tangent bundle, and conversely, the harmonicity of the vector fields $\xi \in \chi(M)$ thought of as maps from M to TM. We consider, on TM, a Riemannian metric of Sasaki type defined by means of an arbitrary nonlinear connection on TM.

COLOURINGS OF A FINITE SEMILINEAR SPACE

Sandro Rajola
Maria Scafati Tallini

Abstract. In a semilinear space $(S, \mathcal{L})$ we define three different types of colourings. By means of them, we study the geometric properties of $(S, \mathcal{L})$. Finally, we prove a theorem concerning proper semilinear spaces. Under some hypotheses which do not refer explicitly to colourings, we prove that $|S|$ is even and $|T| = |S|/2$, for all $T \in \mathcal{T}$, where $\mathcal{T}$ is the family of non–empty subspaces, different from a point, a line and S.

ON FLAT AND INJECTIVE DIMENSION

Siamak Yassemi

Abstract. We provide a catalogue of the resulting relations between flat and injective dimension under change of rings.

HYPERALGEBRAIC SYSTEMS

R. Ameri
M.M. Zahedi

Abstract. In this note at first some basic notions such as hyperoperational (relational) and hyperalgebraic systems are defined and then some related results are given. Then the relationship between a subhyperalgebraic system and its algebraic closure are studied. Finally, the notions of morphism, congruence and quotient hyperalgebraic systems are discussed.

GENERALIZED FRACTIONS, DETERMINANTAL MAPS AND LOCAL COHOMOLOGY MODULES

K. Khashyarmanesh
Sh. Salarian
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1. Introduction

The construction of a module of generalized fractions is due to Sharp and the present third author. For a commutative ring R with identity, an arbitrary R–module M, and a triangular subset U of R^n, they constructed an R–module $U^{-n}M$ of generalized fractions in a process which generalizes the well known theory of localization of modules (see [10]).