

# Prolate Spheroidal Wave Functions Of Order Zero Mathematical Tools For Bandlimited Approximation Applied Mathematical Sciences

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## [Books] Prolate Spheroidal Wave Functions Of Order Zero Mathematical Tools For Bandlimited Approximation Applied Mathematical Sciences

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### **Prolate Spheroidal Wave Functions Of**

#### **Prolate spheroidal wave functions, an introduction to the ...**

3 Derivation of prolate spheroidal wave functions There are several ways to generate the function set, each having its advantages and disadvantages in complexity and precision [3,7,18,24] Within the last ten years, computer processing speeds have climbed to the point where generating the function set is not an issue when it comes to their study

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#### **Prolate Spheroidal Wave Function as Exact solution of the ...**

prolate spheroidal wave functions, The Journal of Fourier Analysis and Applications, 9 (2003) [6] A Osipov, Certain upper bounds on the eigenvalues

associated with prolate spheroidal wave functions, arXiv: 12064541v1(2012) [7] J Förster, A Saenz, U Wolff, Matrix algorithm for solving Schrödinger  
**Prolate Spheroidal Wave Functions, Quadrature, and ...**

Prolate Spheroidal Wave Functions, Quadrature, and Interpolation H Xiao, V Rokhlin, N Yarvin Research Report YALEU /DCS /RR-1199 June 27, 2000  
 The authors were supported in part by DARPA/ AFOSR under Contract F49620/91/C/0084 Approved for public release: distribution is unlimited

### **Generalized prolate spheroidal wave functions**

7 Spheroidal wave functions of zero order in  $13 = 0 \dots a$ ,  $c_5 = 0$  9 Mathieu functions if  $q = a = -89 c \sim 0$  We shall refer to bounded solutions of (1 I)  
 for arbitrary values of  $a$ ,  $1/3$  such that  $a > -1$ ,  $1/1 > -1$ , as most generalized prolate functions 2 FORMULATION AND SOLUTION OF THE EQUATION

### **On the evaluation of prolate spheroidal wave functions and ...**

prolate spheroidal wave functions (PSWFs) provide a natural and efficient tool for computing with bandlimited functions defined on an interval  
 Recently, PSWFs have been becoming increasingly popular in various areas in which such functions occur - this includes physics (eg wave phenomena,

### **Spheroidal Wave Functions Electromagnetic Theory**

the difficulties is the non-existence of orthogonality among spheroidal wave functions The prolate and oblate spheroidal coordinates are two systems  
 in which the scalar wave equations are separable but the vector wave functions are not separable This therefore causes the difficulty of obtaining rigorous

### **The magic of the prolate spheroidal functions in various ...**

The singular functions for the problem of recovering a time limited function from its Fourier transform in a certain band of frequencies are given, in  
 the simplest case, by the prolate spheroidal wave functions We explore a number of issues related to this problem, including the effective computation of the corresponding Slepian functions for

### **Spheroidal Wave Functions. - arxiv.org**

Spectral decay of the sinc kernel operator and approximations by Prolate Spheroidal Wave Functions Aline Bonamian and Abderrazek Karouib1 a F ed  
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 www.elsevier.com/locate/acha

### **REFLECTIVE PROLATE-SPHEROIDAL OPERATORS AND**

operators with prolate-spheroidal properties, associated to the wave functions of all rational solutions of the KP hierarchy vanishing at infinity,  
 introduced by Krichever in the late 1970s 1 Background 11 The prolate-spheroidal phenomenon In his foundational work [39] on communi-

### **Discrete prolate spheroidal wave functions and interpolation.**

components can be analysed satisfactorily with the aid of asymptotic properties of the discrete prolate spheroidal sequences and wave functions The  
 effect of windowing can also be described conveniently in terms of these sequences and functions 1 Introduction In this paper we consider discrete-time, real or complex-valued signals  $s_T = (s(k))_{k \in \mathbb{Z}}$

### **Signal Reconstruction from Nonuniformly Spaced Samples Using ...**

Jan 29, 2010 · appropriate basis for signal interpolation is the Prolate Spheroidal Wave or Slepian functions [15] It is thus possible to develop the projection of signals of finite time support that are nearly band-limited The representation of bandpass signals, as the modulation of baseband components, can be obtained using modulated Slepian basis

### **Software for Computing the Spheroidal Wave Functions Using ...**

prolate spheroidal wave functions when prolate spheroidal coordinates are used; and the oblate spheroidal wave functions when oblate spheroidal coordinates are used Unfortunately, there are no simple expressions for computing them Instead, they must be written as infinite series expansions in terms of various other special functions

### **Bandlimited Signal Extrapolation Using Prolate Spheroidal ...**

prolate spheroidal wave functions (PSWFs) are exploited to form an orthogonal basis set needed for synthesis A significant step in the process is the higher order piecewise polynomial approximation of the overlap integral required for obtaining the expansion coefficients accurately with very high precision

### **ELECTROMAGNETIC SHIELDING PROPERTIES OF A PROLATE ...**

the spheroidal wave functions, are discussed Several inaccuracies and ambiguities in the asymptotic expansions of the wave functions are discussed in detail The formulation of the problem and its solution are treated in Chapter 4 A plane electromagnetic wave is assumed incident on a prolate

### **An Optimal algorithm for the numerical evaluation of the ...**

the procedure was described earlier in [13]; there, the Sturm-Liouville eigenvalues of the prolate spheroidal wave functions are obtained in the fashion described above However, the three-term recurrence relations satisfied by the Legendre coefficients are then used to construct the expansions of the prolate spheroidal wave functions

### **Defense Technical Information Center**

Prolate spheroidal wave functions (PSWFs) play an important role in various areas, from physics (eg wave phenomena, fluid dynamics) to engineering (eg signal processing, filter

### **Spatial Smoothing in fMRI using Prolate Spheroidal Wave ...**

- Lindquist, M, 2003 Optimal Data Acquisition in fMRI Using Prolate Spheroidal Wave Functions International Journal of Imaging Systems and Technology, 13, 126-132 The Prolate Spheroidal Wave Function Filter The prolate spheroidal wave function (PSWF) filter is the function, with compact support on a fixed set of k-space, which maximizes the