

UDC 520/524(048)

ISBN 978-86-80019-74-1

LSST@EUROPE2

Belgrade, Serbia, June 20-24, 2016

Book of Abstracts

Editors: Željko Ivezić, Nicholas Walton
and Darko Jevremović

BELGRADE, 2016



**WALSH ANALYSIS - A CONVENIENT PREPROCESSOR
FOR PERIOD DETECTION IN ASTRONOMY****Miodrag Malović¹ and Darko Jevremović²**¹*Innovation Center, Faculty of Technology and Metallurgy, University of Belgrade, RS*²*Astronomical Observatory Belgrade, RS**E-mail: office@malovic.in.rs, darko@aob.rs*

Walsh analysis is practically analogous to Fourier analysis, except that square wave is used instead of the sine one. It has one major advantage over Fourier - it can be performed much faster. This may seem of little importance at first, since computers have gotten to the point where most programmers do not take any care about the size of their code or the speed of their calculations. However, LSST will provide astronomers with huge data sets, and searching for periodicity peaks with high resolution might require enormous amount of calculations. To perform this analysis in real time (a matter of seconds) it is important to skip non-necessary mathematical operations and focus on applying complex period detection algorithms (such as line fitting, analysis of variance, and others) only in the vicinity of expected peaks, not on all arbitrary periods. To do this efficiently, we propose that Walsh analysis is applied on the data first. A simulation was conducted with artificially generated light curves for the three types of variable stars: RR Lyr, Algols and classical cepheids. LSST current baseline cadence (enigma_1189) was used for the timing of samples.