

Application for Round 3 QIBA Project Funding

Title of Proposal: Software Development for Analysis of QIBA DW-MRI Phantom Data		
QIBA Committee/Subgroup: MR – PDF / DWI		
NIBIB Task Number(s) which this project addresses:		
Project Coordinator or Lead Investigator Information:		
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e-mail:	Tel #:	
Institution/Company: University of Michigan		
Amount Requested:		

Project Description

Collection of DWI and derived quantities, such as ADC, are being incorporated into clinical trials as a potential diagnostic or therapy response biomarkers. Unfortunately, several essential elements of DWI quality control across multiple institutions are still lacking. Deficiencies include: a multi-component DWI phantom design; consensus on system testing procedures; definition of systems performance metrics; and availability of DWI performance analysis software to assess these metrics. A multi-compartment PVP-based DWI phantom has been proposed for QIBA support by Michael Boss at NIST and is herein referred to as “NIST PVP DWI Phantom”. This project will provide the means to measure key system DWI performance metrics for cross-vendor/site comparison thereby forming the basis of DWI site certification and quality control utilizing NIST PVP DWI Phantom data.

Primary goals and objectives

The software will be designed to input DW-MRI DICOM data of the NIST PVP DWI Phantom using two or more b-value acquisitions, and provide: 1) visualization of DWI and multiple derived ADC maps; 2) semi-automated efficient means to define ROIs; 3) statistical analysis of ROIs and VOIs (retrospective combinations of ROIs) applied to DWI and ADC maps; and 4) tabulation of summary statistics of defined performance metrics including bias and random error, SNR and ADC linearity.