# 1 Introduction

### 2 Methods

The dataset consisted of one subject, five runs. Each run contained 302 individual images, each approximately 280 kb in size. This same dataset was used throughout the study. The processing that was done included the following: time slice correction, motion correction, coregistration and normalization, and smoothing. Each of the steps SPM99 behind the covers. The two methods of analysis are described below.

#### 2.1 Processing w/o Dircopy (Script 1)

The data that needs to be processed is located on a CIFS share that is mounted either using NFS or CIFS. Each of the processing steps are run directly on the datasets. The script can be found here: http://dirac.biac.duke.edu/software/pipeline/hall1.

#### 2.2 Processing with Dircopy (Script 2)

The data that needs to be processed is copied to a local filesystem on Golgi. Processing steps are run on the local dataset, and the results of each step are copied back to the original directory. The script can be found here: http://dirac.biac.duke.edu/software/pipeline/hall2.

## 3 Experimental Results

Table 1. Processing Times (in minutes) for Script 1.

	Hodgkin(NFS)	Nernst	Hall	Hodgkin(Sharity)
tralign	11.0115	084.3124*	$144.5520^{*}$	119.0202*
motioncorrect	60.3510	134.7723*	$166.2474^*$	168.7115*
coreg_normalize	55.8590	086.3316*	118.9201*	114.3041*
smooth	06.8616	033.9795*	080.6623*	064.4053*
Total Processing Time	134.083	339.396*	510.382*	466.441*

	Hodgkin(NFS)	Nernst	Hall	Hodgkin(Sharity)
dircopy	01.0108	30.0948	01.7853	01.7660
tralign	08.3141	08.2812	08.0156	07.9025
dircopy	01.0335	21.8552	04.9780	05.2441
motioncorrect	58.1194	57.2193	56.9284	56.3055
dircopy	01.0014	25.5059	04.0760	05.5499
$coreg_normalize$	54.9688	54.2574	53.7302	54.0529
dircopy	00.6427	22.1762	13.0777	07.4277
smooth	05.2889	05.3563	05.1065	05.0531
dircopy	00.6508	15.3648	13.1707	07.4007
Total Dircopy Time	004.3392	114.9970	037.0877	27.3884
Total Processing Time	126.6910	125.1142	123.7810	123.314
Totals	131.0302	240.1139	160.8680	150.702

Table 2. Processing Times (in minutes) for Script 2.

Scripts ran to completion in all test cases. The results of script 1 and 2 differed only in Sharity-mounted datasets. The figures marked with a \* indicate processing steps which had erroneous results. The applications and the filesystem (SPM99, Sharity and the system log) did NOT report any errors. For the NFS mounted dataset, the results of script 1 and script 2 were identical.

### 4 Analysis

The method using dircopy and processing the results locally produced results faster and more reliably regardless of how the datasets were mounted. For those mounted using NFS, performance was significantly faster than that of Sharity counterparts. However this difference is less noticeable running Script 2 on Hall than on Nernst. Since script 1 did not generate accurate results for either Nernst or Hall, we may safely disregard those numbers. These results indicate that there may be a setting server side on Nernst that may not be optimal for this kind processing. Another guess as to what may have happened is that when the Nernst process was running, there may have been other processing scripts concurrently running. Additional tests should verify how scalable both Sharity and NFS are.