Chemical Exchange Saturation Transfer Imaging

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144273/

```
% MT list (set these based on experimental parameters chosen)
%MT is the magnetization transfer
mt_power = ;
mt_duration   = ;
series_list = ; %logarithmic frequencies
f_ppm = ;


%% Read DICOM Directory
% Read frequency offset file

%% Analyze MT data
%Create intensity mask

threshold = 0.1;
mask = img(:,:,1,1,1);
mask = mask / max(abs(mask(:))) > threshold;
ix_norm = ;
ix_MT = ; %index
 fid = fopen(filename, 'r');
C = textscan(fid, '%s', 1);
description = C{1};
C = textscan(fid, '%d', 1);
N = C{1};
C = textscan(fid, '%f', N);
offsets = cell2mat(C);
fclose(fid);
offsets_MT = offsets(ix_MT);
offsets_interp = 10.^[];


% Shift MT data by b0 map
[nx,ny,nz,nt,nr] = size(img);
img_reshape = reshape(img, [nx*ny nt nr]);
img_norm = mean(img_reshape(:,ix_norm,:),2);
img_reshape = img_reshape(:,ix_MT,:);
img_reshape = bsxfun(@times, img_reshape, 1./img_norm);

nt_interp = numel(offsets_interp);
img_b0_corrected = zeros(nx*ny,nt_interp,nr);
for ix = 1:nx*ny
   if mask(ix)
      tmp = squeeze(img_reshape(ix,:,:))
      tmp = interp1(offsets_MT, tmp, offsets_interp, 'pchip')
      img_b0_corrected(ix,:,:) = tmp;
   end
```

```
end
img_b0_corrected = reshape(img_b0_corrected, [nx,ny,nt_interp,nr]);

%% draw rois
if ~exist('masks.mat', 'file')
    figure();
    labels = {'phantom1', ' phantom2', ' phantom3, 'phantom4', 'phantom5'};
    r = draw_rois(img_b0_corrected(:,:,1,1), numel(labels), labels);
    for ix = 1:size(r, 3)
        r(:,:,ix) = and(r(:,:,ix), mask);
    end
    save masks mask r
 end
load masks.mat

[nx,ny,nt_interp,nr] = size(img_b0_corrected);
img_reshape = reshape(img_b0_corrected, [nx*ny nt_interp nr]);

n_rois = size(r,3);
signal = zeros(n_rois, nt_interp, nr);
for ix = 1:n_rois
    signal(ix,:,:) = mean(img_reshape(r(:,:,ix),:,:),1);
end

close all
```