

# Manipulation of HS Data in Matlab

This page summarizes some code snippets on manipulation of HS cubes in Matlab.

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## Import and export of HS data into and from Matlab

Download LoadHSData Matlab function from the [Matlab Scripts](#) page and save it in your Matlab user directory. Import the cube with the following command:

```
[C,p,u] = LoadHSData;
```

Download SaveHSData Matlab function from the [Matlab Scripts](#) page and save it in your Matlab user directory. Save a cube with the following command:

```
SaveHSData(C,p,u);
```

Please see detailed information about file import and export possibilities in the [File Import / Export](#) documentation.

## Code snippet on primitive data manipulation

### Concatenate cubes

```
[C1 p u] = LoadHSData;          %load cube C1 from file
[C2 p u] = LoadHSData;          %load cube C2 from file

%concatenate cubes along sample direction
C3 = cat(3,C1,C2);

%concatenate cubes along spatial direction
C3 = cat(1,C1,C2);

SaveHSData(C3,p,u);             %save resulting cube C3 to file
```

### Rotate cube

```
[C p u] = LoadHSData;          %load cube C from file

%rotate cube in the pixel domain about 90 degree
C=permute(C,[1 3 2]);
C_=zeros(size(C));
for i=1:size(C,3)
    C_(:, :, i) = rot90(C(:, :, i));
end
C=permute(C_,[1 3 2]);

SaveHSData(C,p,u);             %save rotated cube C to file
```

### Crop cube

```
[C p u] = LoadHSData;           %load cube C from file

%crop out a cube of size 11x11x11 beginning at spatial position 10, spectral position 10 and sample position
10
%Note: size of cube must match! - should be greater or equal to 20x20x20 in this example
ivROISpat = [10 20];
ivROISpec = [10 20];
ivROISamp = [10 20];
C = C( ivROISpat(1):ivROISpat(2) ,...
       ivROISpec(1):ivROISpec(2) ,...
       ivROISamp(1):ivROISamp(2) );

SaveHSData(C,p,u);             %save cropped cube C to file
```

### Sub sample cube

```
[C p u] = LoadHSData;           %load cube C from file

%subsample each direction of cube C about factor 2
ivROISpat = 1:2:size(C,1);
ivROISpec = 1:2:size(C,2);
ivROISamp = 1:2:size(C,3);
C = C( ivROISpat ,...
       ivROISpec ,...
       ivROISamp );

SaveHSData(C,p,u);             %save sub sampled cube C to file
```

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