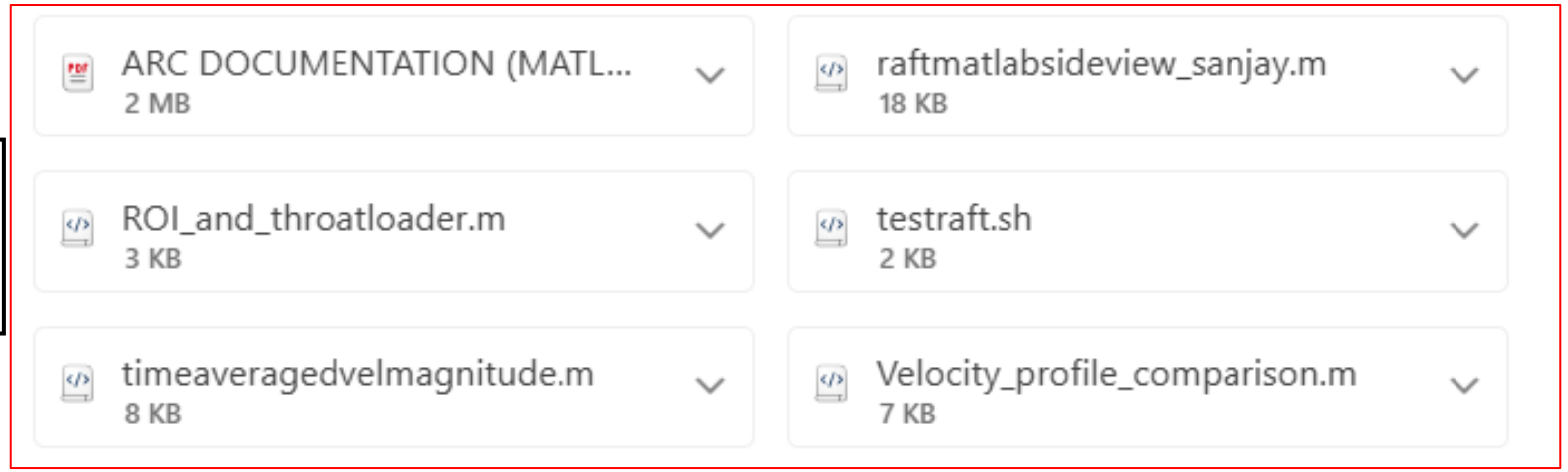
Files needed to run the code on ARC

1. Read me file

2. Code to get Region of interest and throat location

5. Data visualization



3.ARC MATLAB Code to extract results

3.ARC Script

5.Data Visualization

- Throat location
- ROI
- Video
- MATLAB code
- ARC Script

Lines to change for every run

```
%% ------------------------------------------------------------
% Optical Flow RAFT + ROI (roipoly) + Calibrated Velocity in m/s
% Time-averaged velocity + vertical profiles with axes in mm (origin at lower-left)
% ------------------------------------------------------------
clear all; clc; close all;

% --- Load your personal toolbox path safely ---
userPathFile = fullfile(getenv('HOME'), 'matlab', 'pathdef.m');
if isfile(userPathFile)
    addpath(genpath(fileparts(userPathFile)));  % add folder containing pathdef.m
    run(userPathFile);                          % execute your saved pathdef.m
    fprintf('Loaded custom MATLAB path: %s\n', userPathFile);
else
    warning('Custom pathdef.m not found. Using default MATLAB path.');
end



try
    %% --- Specify video path ---
    videoPath = '/home/swathigadevic/SanjayCode_New/CB_noinception.avi';  % <-- Adjust if needed
    [filepath, filename, ~] = fileparts(char(videoPath));

    if ~isfile(videoPath)
        error('Video file not found at: %s', videoPath);
    end

    v = VideoReader(videoPath);
    fprintf('Loaded video: %s\n', filename);
```

Lines to change for every run

```
27
28      v = VideoReader(videoPath);
29      fprintf('Loaded video: %s\n', filename);
30
31      %% --- Calibration parameters ---
32      mm_per_pixel = 0.00388514345;   % [mm/pixel]
33      fps          = 110000;          % [frames per second]
34      m_per_pixel  = mm_per_pixel / 1000;  % [m/pixel]
35      fprintf('Calibration: %.9f m/pixel | Frame rate: %.1f fps\n', m_per_pixel, fps);
36
37      %% ------------------------------------------------------
38      % Load existing ROI mask if available, else select and save a new one
39      % ------------------------------------------------------
40      fprintf('Checking for existing ROI...\n');
41      roiFile = fullfile(filepath, [filename '_ROI.mat']);  % Default ROI filename
42
```

Lines to change for every run

```
#!/bin/bash
#SBATCH --output=RAFT_SideView_%j.out
#SBATCH --error=RAFT_SideView_%j.err
#SBATCH --time=08:00:00
#SBATCH --account=cavitation
#SBATCH --nodes=1
#SBATCH --ntasks=1
#SBATCH --cpus-per-task=48
#SBATCH --gres=gpu:2
#SBATCH --mem=380G
#SBATCH --partition=l40s_normal_q
#SBATCH --mail-type=BEGIN,END,FAIL
#SBATCH --mail-user=swathigadevic@vt.edu
#SBATCH --job-name=Cavitation

module reset
module load MATLAB
```

```
echo "============================================================"
echo " SLURM Job ID:        $SLURM_JOB_ID"
echo " Node:                $HOSTNAME"
echo " Submitted from:      $SLURM_SUBMIT_DIR"
echo " Start time:          $(date)"
echo "============================================================"

# GPU monitoring (every 300 seconds)
nvidia-smi --query-gpu=timestamp,name,pci.bus_id,driver_version,temperature.gpu,utilization.gpu,utilization.memory,memory

# ------------------------------------------------------------------
# Launch MATLAB (non-interactive batch mode)
# ------------------------------------------------------------------
matlab -nodisplay -nosplash -nodesktop -batch "run('/home/swathigadevic/SanjayCode_New/raftmatlabsideview_sanjay.m')"
```