

# Richardson Extrapolation Applied to Direct Integration

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# Approach

- Read all-sky ocean fluxes from subset SSF
- Bin in angular bins of decreasing size
- Look at directly-integrated flux as a function of angular bin size (simple and Gauss-Legendre integration)
  - Shortwave Flux
  - Longwave Flux

# Angular Bin Sizes

Relative Azimuth Angle Bin Size (Degrees)

2

5

10

1

2

View

Zenith

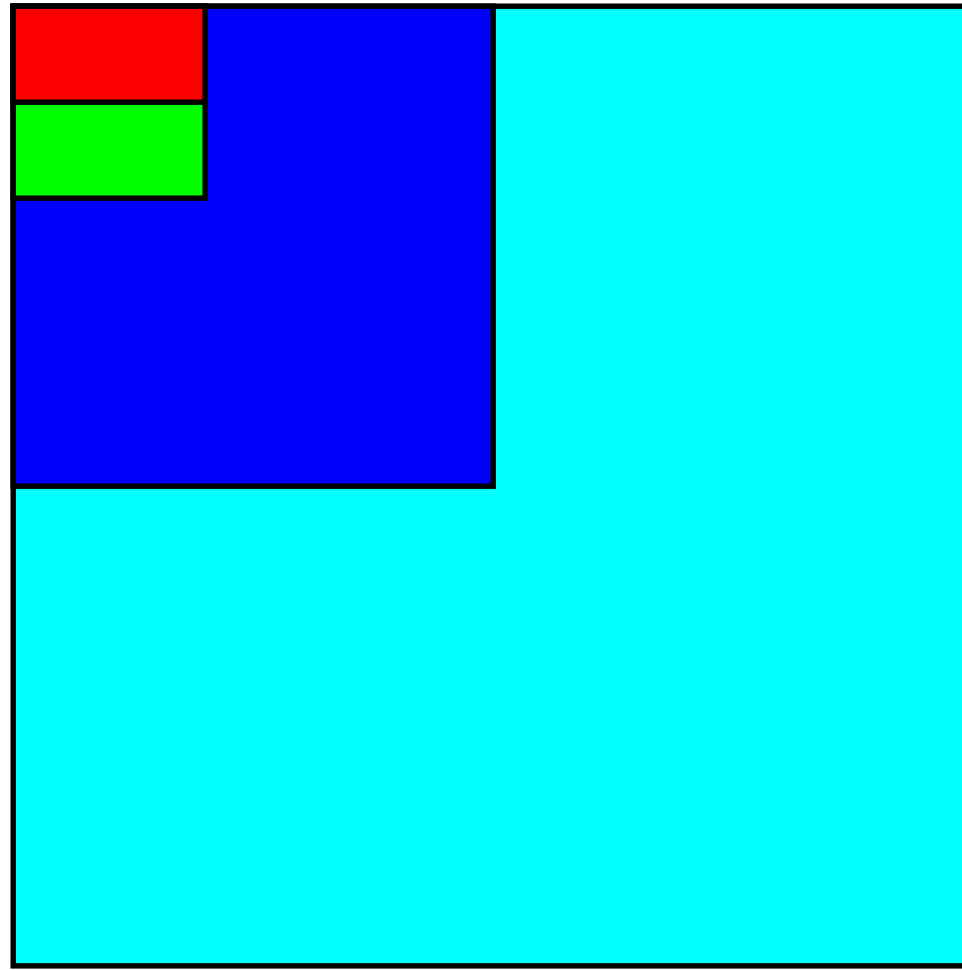
Angle

5

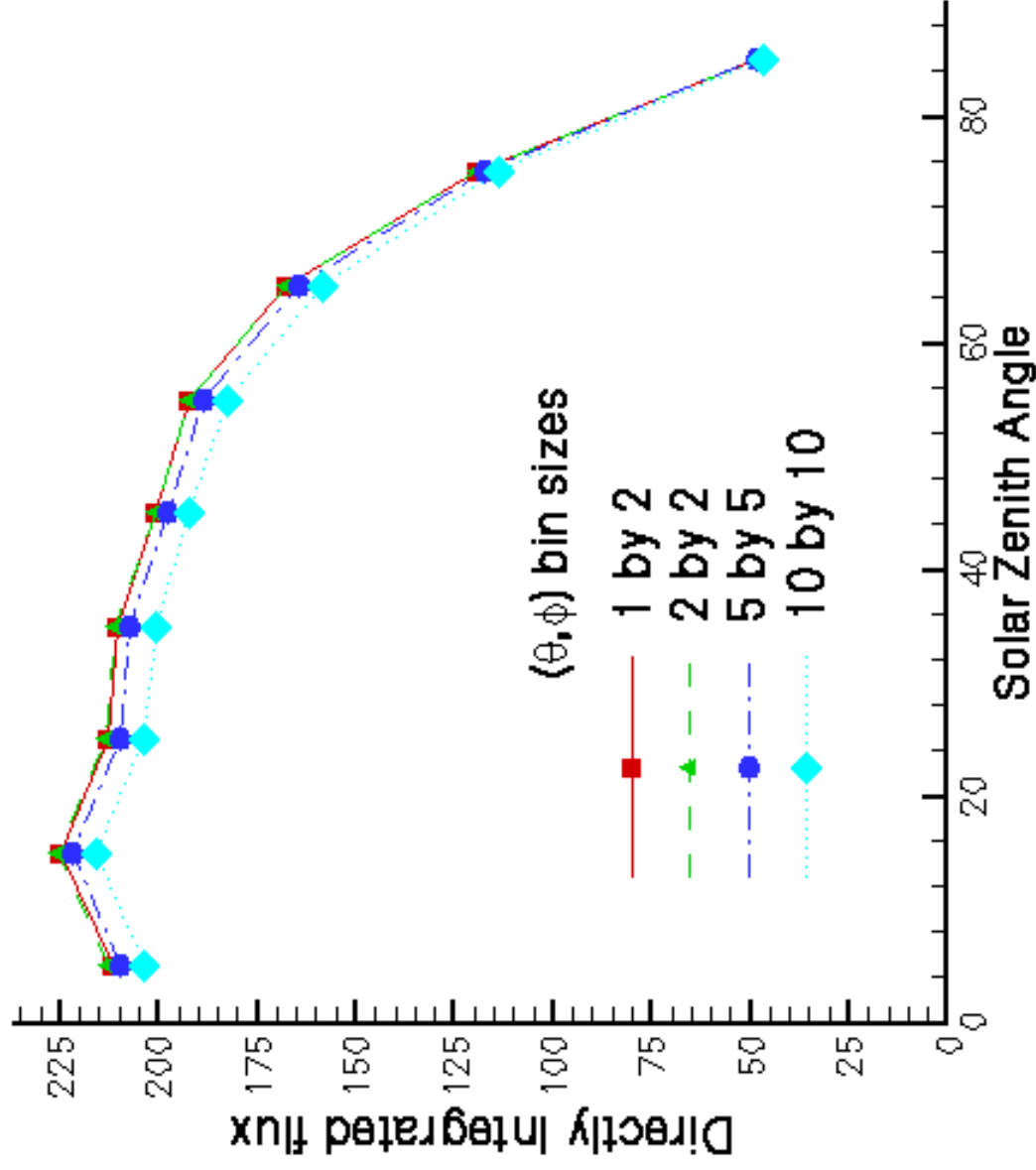
Bin Size

(Degrees)

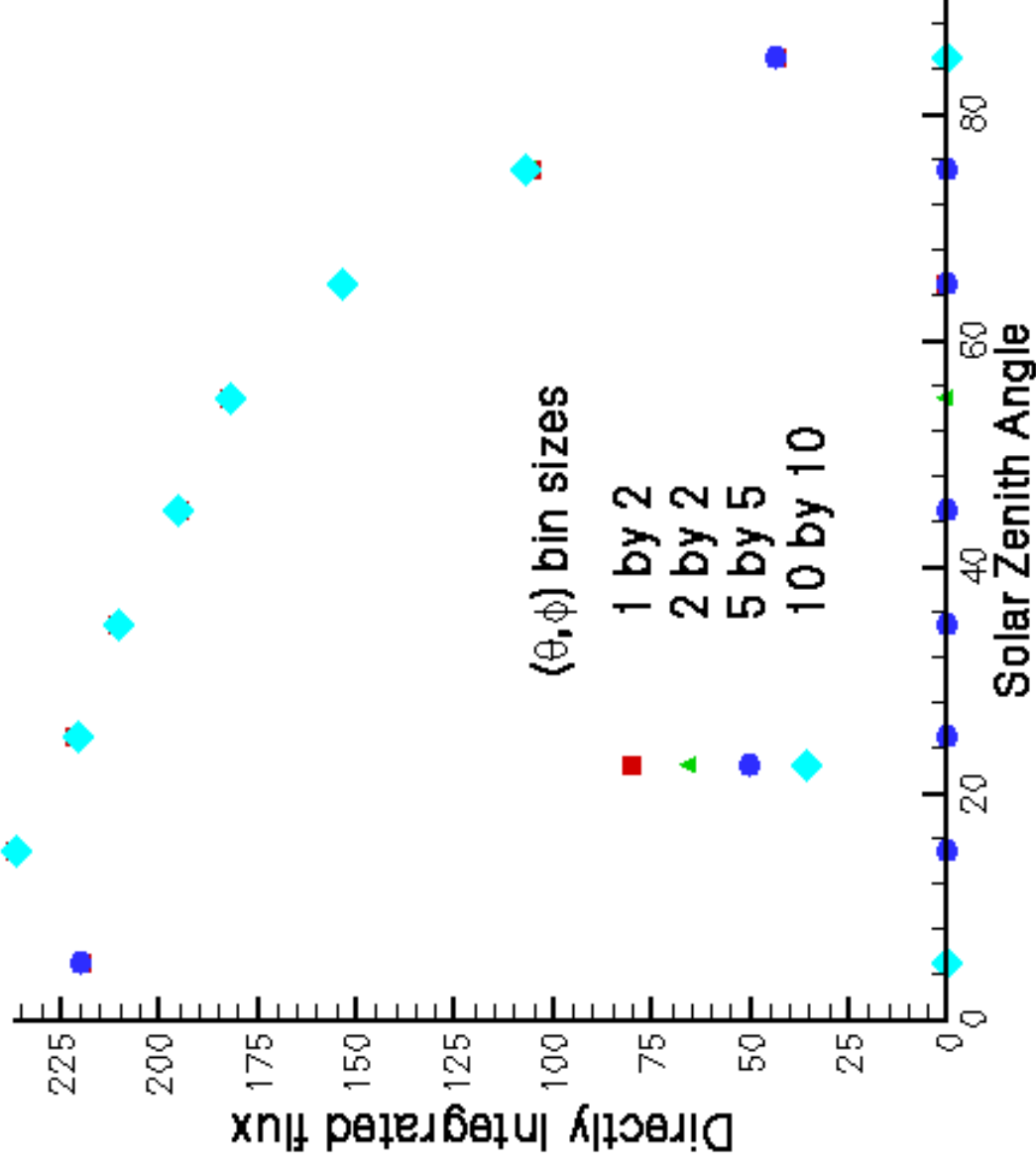
10



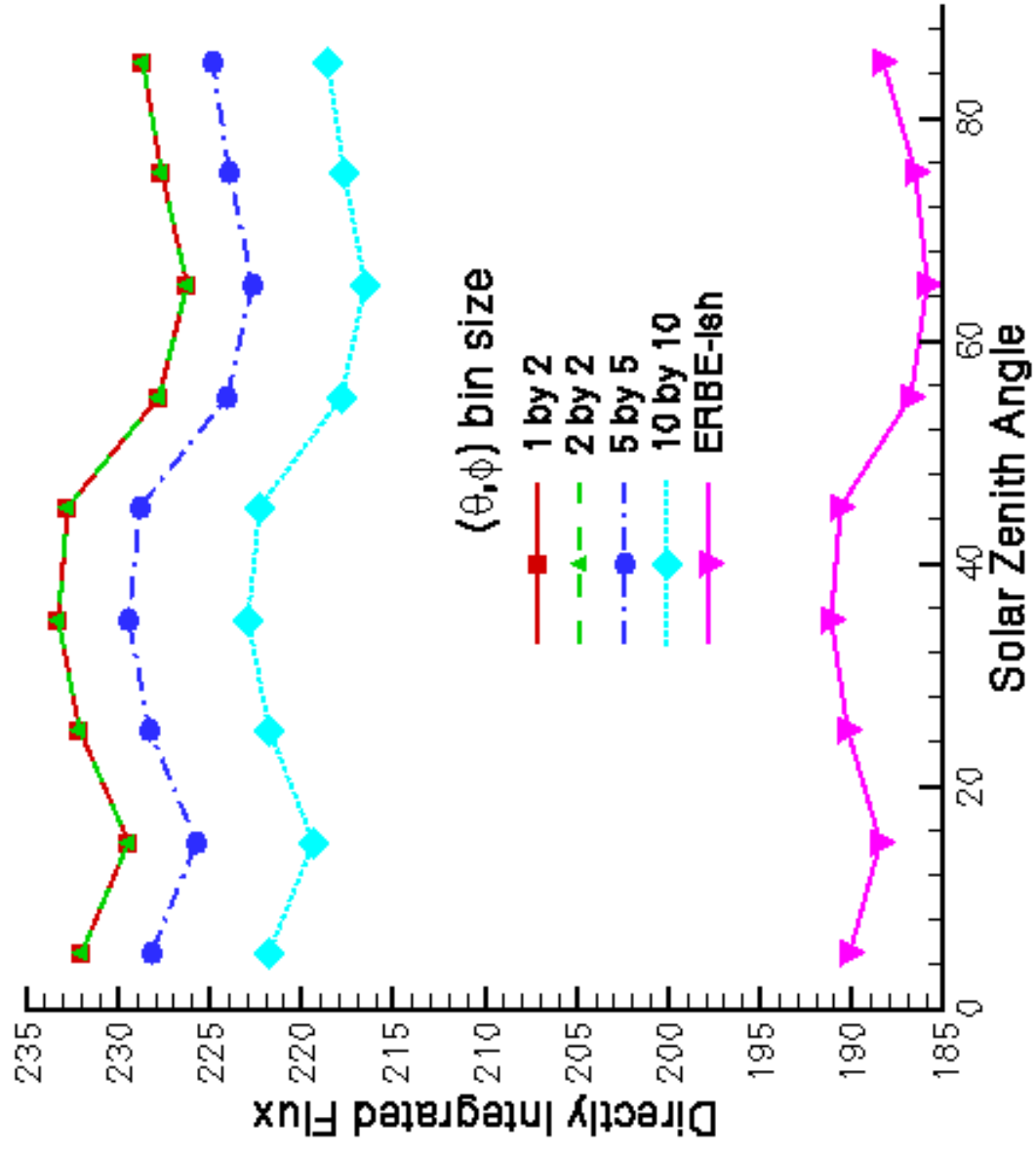
# Shortwave Flux - Simple Integration



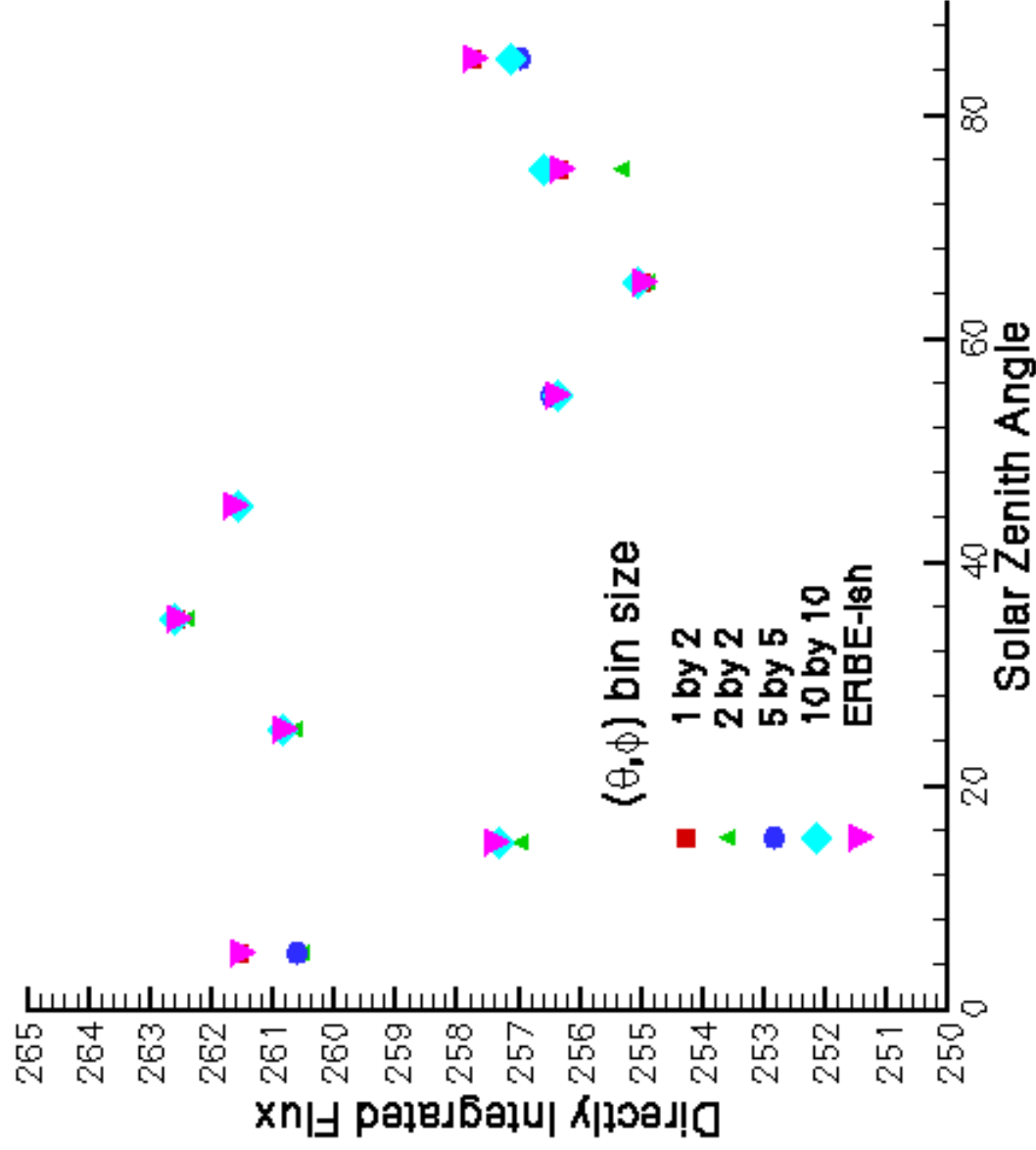
# Shortwave Flux - Gauss-Legendre



# Longwave Flux - Simple Integration



# Longwave Flux - Gauss-Legendre

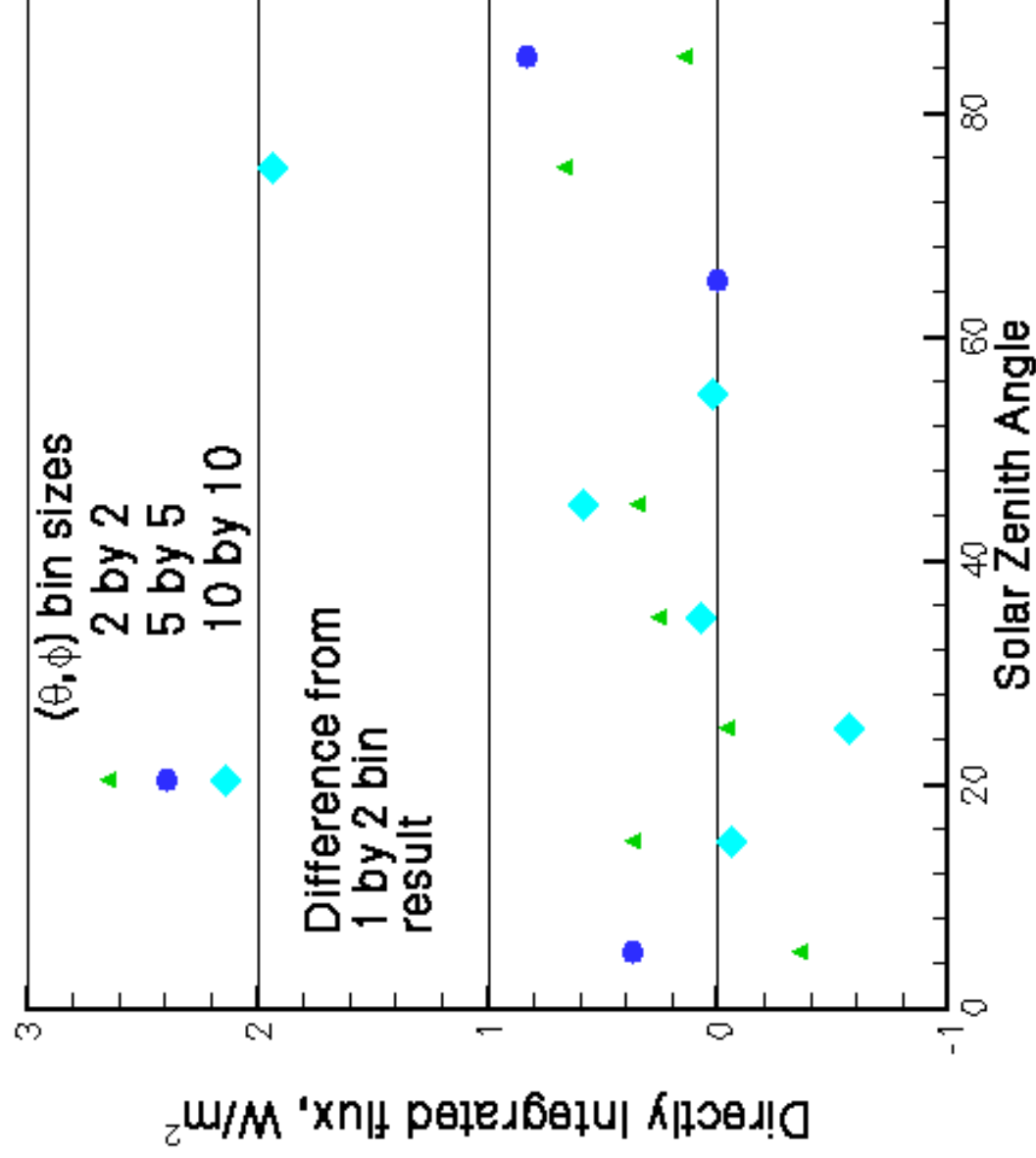


# Results

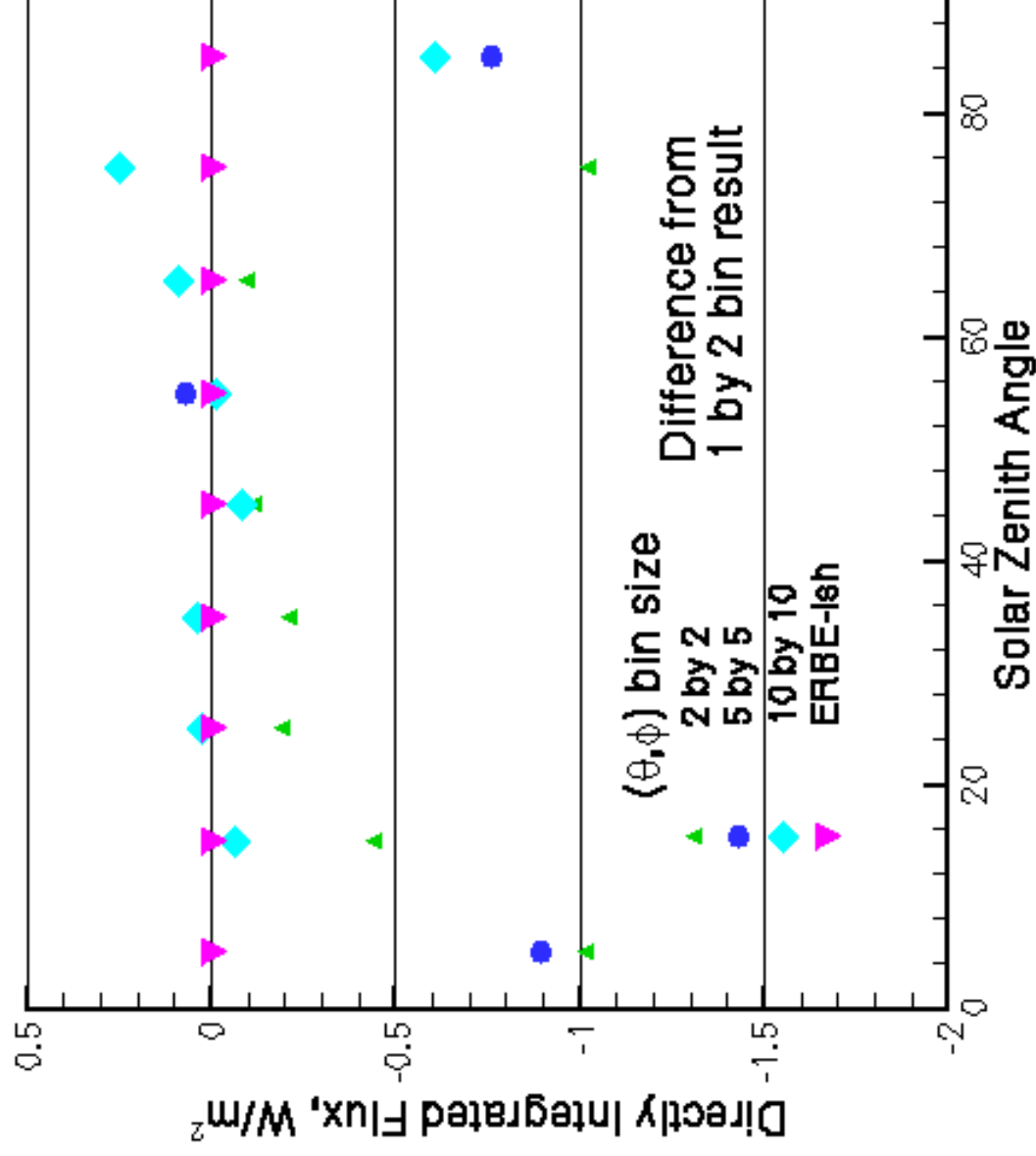
- There is a 5-10  $\text{W/m}^2$  increase in both LW and SW flux
- Affects directly integrated fluxes used in the Vemury test
- Only occurs for the simple integration method



# Shortwave Flux - Gauss-Legendre



# Longwave Flux - Gauss-Legendre



# Future Ideas

- Effect of interpolation method
- Compare 2 results for direct integration
  - Days (1, 3, 5, 7, ...) vs. Days (2, 4, 6, 8, ...)