A Study of the Rain Impact Model (RIM) under different wind speed conditions

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**RESULTS**

**FIRST RESULTS: CONSTANT Kz**

RIM FORMULATION

\[ \text{RIM}_{\text{SSS}} = \text{S}_i \left( \left[ \frac{\text{R}_i}{\sqrt{\text{K}_z \times t}} \right]^{\text{WS}/2} \right) \]

Rain Impulses @ 30 min samples \((i = 1:48)\)

- \(\text{S}_i\) = HYCOM Salinity (psu)
- \(\text{K}_z\) = vertical eddy diffusivity (m²/s)
- \(\text{z}\) = depth (m)
- \(\text{t}\) = time (s)
- \(\text{R}\) = rain impulse function (m)

- \(\text{R}_1 = \text{c}_1 \cdot \text{f}(\text{IRR})\)
- \(\text{R}_2 = \text{c}_2 \cdot \text{f}(\text{IRR})\)
- \(\text{c}_1\) & \(\text{c}_2\) empirical weighting coeff.

**VARIABLE DIFFUSIVITY**

SATellite - in-situ

AQUARIUS

SMAP

SMOS

**SUMMARY**

- Rain stratifies the ocean, creating a fresh layer near the ocean surface
  - This layer mixes laterally and vertically over a few hours
- The rain-affected surface layer will be fresher than seawater from directly below
  - Satellite-measured salinities would be fresher than in-situ measurements (5 m - 10 m depth)
- RIM has been demonstrated to work for Aquarius, SMAP & SMOS
- RIM-predicted SSS agrees well with surface salinity retrieved from satellites
- RIM provides a robust quality flag for identification of salinity stratification

### OBSERVATIONS DURING RAIN

- Single Rain Event
- Multiple Rain Event

### APPROACH

- Rainstratification
- Rain Accumulation
- Rain Stratification
- Model Salinity

### RIM FORMULATION

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