Science Goals Related to Spray Modification of Hurricane Winds and Turbulent Fluxes

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<table>
<thead>
<tr>
<th>Goals</th>
<th>Plans</th>
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<td>Science Goals:</td>
<td>To improve the roughness lengths for momentum, potential temperature, and specific humidity:</td>
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<td>○ Better estimates of the transfer coefficients in tropical cyclones</td>
<td>● Hard constraint: prescribed value</td>
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| ○ Better estimates of the impact of spray and evaporation on the apparent surface temperature and humidity | ● Soft constraint:  
  \[
  \text{weight} \cdot (\ln(\epsilon_{\text{calculated}}) - \ln(\epsilon_{\text{theoretical}}))
  \]
| ○ Ratios of enthalpy flux to drag | When compared to other terms in the function |
| ● Improved roughness lengths | ● Weight small: roughness length within a few orders of magnitude of the theoretical value |
| ● Increase size of dataset | ● Weight large: roughness lengths are way too big or too small |

10m winds are estimated from the solution at 10m above the displacement height.

- Points: individual dropsonde profiles
- Rolling bins used to make lines
  - Solid blue= Median (on bin center)
  - Dashed blue= uncertainty
- Shading:
  - dark= quartiles (25-75 percentiles)
  - Light= 5-95 percentiles \((N \geq 30)\)
  - Blue= Higher confidence \((N < 30)\)
  - Gray= Lower confidence

10m winds are estimated from the solution at 10m above the displacement height.

\[
C_D(10m) = \left(\frac{\text{v}_{10m}}{\text{u}_{10m}}\right)^2
\]

References


Contact

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Please feel free to reach out with any questions!

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