Retrieval of Snowfall Rate

- Approach
  - Use one-layer two-stream RTM to retrieve IWP under snow condition
  - Derive empirical equation connecting IWP with NEXRAD reflectivity
  - Adopt an existing reflectivity-snowfall rate equation
  - Derive snowfall rate from IWP

- Results
  - Regression between IWP and radar reflectivity (Z):

    $IWP = 5.64E\text{-}6Z^3 - 2.89E\text{-}4Z^2 + 8.94E\text{-}3Z$

  - Z-R (snow rate) relation by Sekhon & Srivastava (1970)

    $$Z = 398\ R^{2.21}$$

  - Highest correlation coefficient between retrieved R and hourly snowfall observations with 1-hr lag
  - Use lookup table to derive R from IWP

Lancaster, OH, Feb 15 - 17, 2003

Newark, OH, Feb 15 - 17, 2003