Winds And Aviation Operations: Degrees of Freedom in Considering Relevant Domains

Wind Conditions drive:
- Significant safety needs / protocols
- Airport / airspace capacity
- Achievability of NextGen operations
- Pilot, ATC, ATM, AOC operational decision-making
- Ground and cockpit actions

Meteorological Phenomenology:
- Surface wind speed, gusts
- Surface wind direction
- Wind shifts
- Low-level(s) wind shear
- Microbursts / Macrobursts
- Steering / Flight-level / Jet stream winds

Translated, Wind-Induced Operational Considerations (Sample)
- Runway configuration, taxi queue management
- Crosswind / tailwind impacts, constraints
- Airport capacity (degraded operations)
- Wind compression
- Jet stream optimization / avoidance (fuel management, schedules)

NAS Operations / Decision Support / TMI's Accountable To Winds (Sample)
- Trajectory-based Operations / Time-based Metering (TBFM)
- Required Time of Arrival (RTA)
- Interval Management (IM)
- Runway Configuration Management (RCM)
- Wake Turbulence Mitigation for Departures (WTMD)
- Airport Acceptance Rate (AAR) Setting / Capacity Utilization
- Optimized Oceanic “Nat tracks” Utilization

- Affects operations for all phases of flight
- Safety / efficiency impact for commercial and GA operations
- Large temporal and spatial domain ranges
Winds Panel Discussion Focus Today

• **Wind Constraints and Opportunities – AOC perspective**
  Tom Lloyd – Manager, Meteorology & Route Optimization, JetBlue Airways

• **Isolating / Predicting Wind Conditions Conducive to Operationally Significant Wind Compression Events**
  Colleen Reiche, Senior Scientist, AvMet Applications
  (Research sponsor: FAA NextGen Weather Office – ANG-C6)

• **Wind Needs for NextGen Operations**
  Tom Reynolds, Assistance Group Leader, Air Traffic Control Systems, MIT Lincoln Laboratory
  (Research Sponsor: FAA Weather Technology in the Cockpit (WTIC) program, ANG-C6)