wind shear is the most troublesome fact during aircraft taking-off and landing generating sources: convection, frontal surfaces, sea or mountain breezes, strong surface wind coupled with local topography, mountain waves or low level temperature inversions.

Low level wind shear for Bucharest Otopeni airport study - using SODAR (Elizabeth Walls, and Niels LaWhite, SODAR and Extrapolated Tower WindShear Profile Comparison in Various Topographic Conditions, EWEC2009 Marseille, 2009)

α power law share exponent describes the shape of the wind shear profile:
- low α little shear (wind speed does not drastically change)
- high α large increases in wind speed

- comparison with NWP ALADIN (Alaro version) wind shear profile
  \[ \frac{U}{U_{ref}} = \left( \frac{z}{z_{ref}} \right)^\alpha \]
  \( \alpha_{ALADIN} = 0.27292 \) > \( \alpha_{SODAR} = 0.22769 \)
  - the model has a more logarithmic profile;
  - underestimates the wind shear (systematic error; the lowest error for July 2014 – convective activity)
  - comparable diurnal cycle

First tests using ALARO-1 version - PBL forecast using two LIDAR systems

LIDAR data provided by Adrian Timofte and Silviu-Octavian Gurlui

ALARO-1 model simulates better the PBL height

• semi-implicit semi-Lagrangian 2TL, Δt=24h s
• physical parameterizations: ALARO-0 baselines including last developments from 2012 concerning thermodynamics adjustment (dependency of critical relative humidity on the model resolution for Xu - Randall adjustment), microphysics (sedimentation of cloud water and ice) melt deep convection (modulation of the entrainment rate by the vertical integral of relative humidity, adaptive detrainment, mixed type of closure)

LSC from AMRUG2, 24h frequency ; DFT Initialization;
6 runs/day 00, 06, 12, 18 UTC - no DA; Forecast range: 78/54/54/54 hours

Characteristics
- semi-implicit semi-Lagrangian 2TL; Δt=24h s
- physical parameterizations: ALARO-0 baselines including last developments from 2012 concerning thermodynamics adjustment (dependency of critical relative humidity on the model resolution for Xu - Randall adjustment), microphysics (sedimentation of cloud water and ice) melt deep convection (modulation of the entrainment rate by the vertical integral of relative humidity, adaptive detrainment, mixed type of closure)

LSC from AMRUG2, 24h frequency ; DFT Initialization;
6 runs/day 00, 06, 12, 18 UTC - no DA; Forecast range: 78/54/54/54 hours

Post-processing and visualization
PFOS : in line – geographical grid (0.1 x 0.125)
off line – model grid
Specialized forecasts for different customers
Graphics based on Maps for web site

Downstream applications
Atmospheric input for:
• Hydrological model;
• Wave model from ALADIN
• Num circulation model from ALARO-SELAM

Ottopeni airport wind shear profile

wind shear is the most troublesome fact during aircraft taking-off and landing

Low level wind shear for Bucharest Otopeni airport study

• non conventional data, particularly:
  - SODAR registrations (SOdion Deteclion And Ranging system)
• wind shear profile evaluation : statistical approach
  - 3 month period (May-July 2014) statistics
  - a simple method to estimate wind shear profile
    - using SODAR
      (Elizabeth Walls, and Nils Latif, SODAR and Extrapolated Tower WindShear Profile Comparison in Various Topographic Conditions, EWEC2009 Marseille, 2009)