Wind measurement is considered as one of the most important issues for the prediction and elucidation of meteorological phenomena. As the formal instrument for wind measurement, ground-based anemometer, radiosonde, Doppler radar and Wind Profiler are utilized so far. However, it is quite difficult to scan the three dimensional (3D) wind field including zenith, and only Doppler radar can be utilized to measure 3D wind speed and direction in the case of rainfall.

In recent years, Doppler LIDARs have been developed and it can scan 3-D wind field even in the case of fine weather and is proceeded to be utilized in a variety of fields.

Therefore, it is possible to implement all-weather wind measurement with the set of Doppler LIDAR and Doppler radar and this set is much effective to monitor the safety of air at the airport, launch complex and other fields.

Coherent Doppler LIDAR

**DIABREZZA™ A Series**

Since 2013, MELCO developed the the 2nd generation model named ‘DIABREZZA™ A Series’ for microburst / wind shear detection uses at airports.

**Signal to Noise Ratio (SNR)**

**Line-of-Sight Velocity (LOS)**

DIABREZZA™ A Series has now the most powerful transmitter in the worlds, which is called 'Planar waveguide amplifier'.

In 2016, MELCO improved this LIDAR system to add a new function for zenith observation to obtain vertical wind profiles up to 15km or more of height.

**Introduction**

KARI** and MELCO utilize LIDARS including a new function for zenith observation.

Wind Profiler had the experience to observe wind vertical profile with an altitude of 9 ~10km.

We have performed the inter-comparison test up to 10 km with Radiosonde for the reliability verification of LIDAR.

**Results for Inter-comparison with Radiosonde**

Inter-comparison test has been performed for 25 times (01~03.2017).

KARI and MELCO has proved that DIABREZZA™ has an excellent observation performance up to 10km.

MELCO will proceed to tune VAD algorithm for improving the result of No.14, 17.

**Test procedure**

Radiosonde goes up from the ground to an altitude of 10km with Weather balloon for 30 min. and outputs 1 min. averaged data.

LIDAR data is outputted every 2 min.

Refer to ‘Altitude’ and ‘Timestamp’ of Radiosonde, the nearest LIDAR data is chosen to compare every 2 min.

![Table 2 LIDAR observation parameter](image)

![Table 3 LIDAR observation parameter](image)

KARI and MELCO has proved that DIABREZZA™ is a very useful device for upper air observation. KARI is expected to develop new applications for DIABREZZA™.