The establishment of micro air velocity standard facility of (0.2~1)m/s based on 83m guide trial at NIM

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In the field of Bio pharmaceutical or chip fabrication micro air velocity even less than 0.2m/s has to be measured to ensure the cleanliness during the manufacturing process. In most cases micro air velocity measurement could be achieved by hot wire anemometer. However, due to the problem of sensor pollution it is not easy to calibrate the hot wire by LDV which employed as reference. At NIM the new micro air velocity standard facility is established based on 83m guide rail in underground 8.3m deep. The anemometer sensor is amounted in the carriage that slides with consistent speed and the sliding stroke is measured by laser interferometer accurately. By this way in the range of (0.1~1) m/s the hot wire anemometer could be calibrated with the expanded uncertainty *U*rel=10mm/s, *k*=2. Additionally to evaluate the accuracy of LDV in range of micro air velocity, particle tracing effect is investigated. In this case the diameter, density and viscosity of tracing particle are measured to determine BBO equation’s parameters. The results of hot wire anemometer calibrated by both carriage and LDV are compared. The experimental results suggest that the influence of tracing effect on micro air velocity measurement is small enough to be neglected as the BBO equation’s calculation result.芯片制造