Over 346 million people worldwide have diabetes. World Health Organization (WHO) projects that diabetes deaths will double between 2005 and 2030. In general, diabetes is diagnosed on a basis of glucose concentration in blood. **A non-invasive and painless method for diagnostic, preventive and monitoring diabetes is still expected.** Previous studies carried out by the principal investigtor have focused on the possibility of developing a microsystem for non-invasive detection of diabetes based on exhaled breath analysis using gas sensors in conjunction with micropreconcentrators. **The breath analysis could be faster, cheaper, more flexible and comfortable than a blood analysis**. However, the exhaled acetone is usually in the range of 0.2 - 1.8 ppm for healthy people, and over 2.4 ppm for people with diabetes. **Unfortunately, portable devices for exhaled acetone measurements remain currently unavailable.** One of the promising methods to increase limit of detection is GLAD technique applied in magnetron sputtering technology. With this technique, the shape, size and density of nanostructures can be well controlled by deposition parameters such as deposition angle, operating pressure, substrate temperature, deposition power, etc. **The main goal of the project is to carry out the fundamental research focused on the examination of the influence of GLAD (Glancing Angle Deposition) technique in magnetron sputtering technology on the achievable 3S properties (Sensitivity, Selectivity, Stability) of gas sensors, featuring enhanced sensitivity to acetone, which is considered as one of the biomarkers of diabetes and it is present in exhaled human breath.** The performance of gas sensors is generally characterized by three properties: sensitivity, selectivity and stability. Since the highest gas sensors responses are associated with gas sensitive layer, **the primary objective of the project is to improve the quality of gas sensitive layer by applying GLAD technique**. In this project, the metal oxides of WO_3, SnO_2, TiO_2, MoO_3 and CuO will be applied, based on the previously obtained results as well as the literature research, where the ability to use mentioned oxides in the term of diabetes biomarkers detection has been proved and described. **In the project, the impact of the GLAD technique parameters, such as: deposition angle (α) and substrate rotation angle (φ) and substrate temperature to gas sensitive layers will be analyzed.**