

## OB-10

### High- $T_c$ SQUID Detection System for Contaminants in Food and Drug

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We have a chance to take unfavorable contaminants accidentally mixed with food. For example, they are small chips of processing machines and broken syringe needles used for immunization shot or hormone injections, which are mostly metallic materials. The contaminant in drug is also a big problem. According to the increase of international concern regarding food and drug safety, we should develop a high sensitive detector to ensure the safety. Although an iron particle detection system has been already developed, there is no system for food or drug contaminants. Our target is detection of a stainless steel contaminant in food and drug. Since the conductivity of the austenitic stainless steel is low, it is difficult to detect it using a conventional eddy current method. An austenitic stainless steel material is originally non-magnetic. However it shows properties like a ferromagnetic material after martensitic transformation during its manufacturing process. Therefore the most of stainless steel contaminants can be magnetized. So the samples should be magnetized by a strong permanent magnet before measurement to obtain a higher sensitivity. We constructed a demonstration system. The system could successfully detect stainless steel tube with length of 2 mm and 0.9 mm in diameter at 200 mm far from the SQUID sensor. In this paper, we describe the system for small stainless steel contaminants in food and drug by using high- $T_c$  SQUID magnetometer.

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