BACKGROUND: Colorectal cancer is a common and lethal disease and colonoscopy is the preferred modality of screening, although associated with high costs and low patient compliance. Recently, a non-invasive device was developed for detecting differences in electromagnetic properties of cancerous and normal tissues, using a non-linear tuneable oscillator (TRIMprob®) Tissue Resonance Interaction Method.

AIM: To evaluate the diagnostic accuracy of the TRIMprob®, in detecting colon lesions.

METHODS: Before colonoscopy, each patient was screened with the TRIMprob® for colonic lesions by an operator in blind. The device was moved over the surface of the abdomen area, with the patient standing, normally dressed, between the operator and the system receiver (fig 1). The signal variation of 3 spectral lines, for 465-MHz, 930-MHz, and 1395-MHz frequencies were recorded. The different anisotropy reveals abnormal tissues. The complete 465 MHz line attenuation, as codified in the literature, was used as a warning signal of a cancer detection. Biopsies collected during colonoscopy were used as Gold Standard.

RESULTS: 121 consecutive patients were collected to date. The TRIMprob® was able to detect colorectal cancer in all patients (8 out of 8) (Fig. 2). Sensitivity, specificity and accuracy of the Bioscanner® compared to the histological examination were 100%. In addition, 44 adenomas were identified. Among these, the device, according to the Gold Standard was able to distinguish adenomas with high-grade (2/3) and low-grade dysplasia (41/41) and according to endoscopy to identify size, number and location of adenomas. Furthermore, signal variation was recorded for the presence of diverticula in 15 of 15 patients as demonstrated by colonoscopy. The concordance of the TRIMprob® vs histology and vs Colonoscopy results was highly significant (p < 0.0001).

CONCLUSION: Although these preliminary results need to be verified and extended in routine clinical setting, the high diagnostic yield of the TRIMprob® suggest that this method should be suitable as a first-level screening tool in detecting colorectal lesions.