

## **ASSESSING INTERNAL CELL DYNAMICS BY RASTER SCANNING IMAGE CORRELATION SPECTROSCOPY (RICS)**

**Klaus Weisshart**  
**Carl Zeiss MicroImaging GmbH,**  
**Carl-Zeiss-Promenade 10**  
**07745 Jena, Germany**  
**Email: [weisshart@zeiss.de](mailto:weisshart@zeiss.de)**

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There is increasing need in modern biology to analyze reactions in terms of available molecule numbers, interactions and diffusion in order to obtain quantitative information on the underlying cellular processes. Such dynamic parameters are recorded during laser scanning microscopy in the generated intensity image, yet they are not readily accessible from this kind of data display. Image transformation tools, on the other hand, will retrieve this useful information without the need to disturb the equilibrium state of the cell. As such Image Correlation Spectroscopy (ICS) has helped in the analysis of dynamic processes taking place at a slower time regime, particularly those in membranes. With the advent of Raster Scanning Image Correlation Spectroscopy (RICS) fast dynamics can now be followed up down to the  $\mu\text{s}$  scale and hence all relevant diffusion processes can be studied in a cellular environment. Moreover, region of interest (ROI) analysis will allow mapping of diffusion times and particle numbers to different cellular compartments. RICS is now available as a software module in the new LSM 710. The technology works on upright and inverted microscope stand versions as well as with one and two photon excitation rendering it a versatile tool for different experimental conditions. The outstanding sensitivity and excellent signal-to-noise of the LSM 710 guarantee the successful analysis of even faint signals enabling the detailed study of proteins expressed at physiological relevant levels.