

Abstract Submitted  
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**Quantitative analysis of the debonding structure of soft adhesives**<sup>1</sup> MATTEO NICOLI, Lab. PMC - Ecole Polytechnique, FRANCOIS TANGUY, COSTANTINO CRETON, Lab. PPMD - ESPCI — Pressure sensitive adhesives (PSAs) are viscoelastic or viscoplastic materials that adhere to a substrate upon the application of light pressure. The debonding mechanism is an interfacial process due to different phenomena, e.g. the creation of cavities and fibrils, the propagation of interfacial cracks and the lateral invasion of air fingers. The studies of adhesive performances of PSAs are carried out through the probe tack tester. We developed a boundary recognition algorithm to analyze the top-view images from probe tack experiments, allowing us to detect the nucleation of cavities, track their growth and measure various geometrical quantities. We tested three PSAs with different viscoelastic features, ranging from a more liquid to a more elastic behavior, at two debonding velocities ( $1, 10 \mu\text{m}\text{s}^{-1}$ ). We measured the load bearing area and estimated the magnitude of the shear stress from the nominal force and the uniaxial tensile stress. From the characterization of the projected radius of each bubble, we tested the assumption of spherical growth of these cavities after the onset of their nucleation. The probe tack test combined with our methodology provides valuable data to understand the interfacial processes leading to the debonding of PSAs.

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