

## Highly Buckled Metal Thin Film on a Polymer Substrate

배중건, 이원보<sup>†</sup>

서울대학교

(wblee@snu.ac.kr<sup>†</sup>)

Buckling or wrinkling is commonplace phenomenon in Mother Nature that spans a multitude of length scale from intestinal villus to geological stratum. Mechanical buckling, however, had been recognized failure problem in structural mechanics. After a research regarding controlled buckling of thin films on compliant substrates has been used to advantage in diverse fields such as micro-nano fabrication, optics, biomimetics as well as metrology.

These buckled surfaces are generally formed on thin hard skin/soft foundation bilayer systems and their wavelength is decided through competition of stiffness of them, respectively. Conventional method to fabricate crumpled surface is evaporating metal films on elastic materials such as PDMS. Our system is little different because we deposit Al thin film on a UV-curable prepolymer. We can observe buckling to folding transition in our system. Finally there exist high aspect ratio of buckling and folding simultaneously resulted from viscoelastic property of polymer substrate. Also, a large deformation possibly occurs, folding which involve highly localized curvature appears too.