BBSO/GST OBSERVATIONS OF FINE STRUCTURES AND FAST DYNAMICS IN SUNSPOT LIGHT BRIDGES

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Observations from the GST telescope have revealed unprecedented details and fast dynamics in sunspot light bridges. (1) We examined the high-resolution TiO images and discovered a new type of fine structures in light bridges: striking knot-like dark structures within the central dark lane. These dark knots divide the central dark lane into multiple sections, and they appear to be very common in narrow light bridges. The evolution of these highly dynamic dark structures could provide detailed information about the magnetoconvection in light bridges. (2) Through a detailed analysis of the spectropolarimetric data taken by the NIRIS instrument, we found unambiguous evidence of small-scale flux emergence in a light bridge. An H-\textalpha jet is clearly triggered by the interaction between the emerging flux and the background field. (3) Through joint GST and IRIS observations, we identified unambiguous evidences of magnetic reconnection in light bridges: frequently occurring inverted Y-shaped jets in the H-\textalpha wing images and UV burst-type profiles of the transition region lines. We also demonstrated that the surge-like activity above light bridges has two components: the ever-present short and slow surges likely to be related to the upward leakage of magnetoacoustic waves from the photosphere, and the occasionally occurring long and fast surges that are obviously caused by the intermittent reconnection jets.