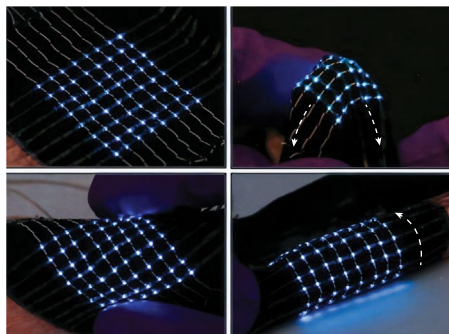


Electroluminescent fibres for making fabrics shine



Incorporating light sources into textile substrates can be used to make flexible and wearable displays for applications such as health monitoring. Typically, this is done by adding light sources, such as light-emitting diodes or electroluminescent materials, to an existing textile, but this can limit the fabric's flexibility and make it difficult to wash. Methods used to electrically connect the devices can also restrict them to simple patterns. Chi Hwan Lee and colleagues at Purdue University and Indiana University School of Medicine now report multicolour electroluminescent threads that can be embroidered

into consumer fabrics using standard embroidery machines to make light-emitting textiles.

The electroluminescent threads – which can emit blue, green or yellow light – consist of a coating of zinc sulfide phosphors and thermoplastic polyurethane on a conductive thread. They are stitched into the fabric together with transparent conductive threads, made of silver-nanowire-coated nylon fibre, to form pixels where they overlap. The researchers show that a variety of designs can be embroidered into a textile at a rate of 350 stitches per minute. The light-emitting pixels showed little degradation of intensity after 10,000 cycles of 20% strain and 50 machine washing cycles. To illustrate its use for wearable displays, a 6×3 pixels array was added to a football helmet liner, which displayed the results from an accelerometer when the helmet was subjected to different severities of mechanical impact.

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