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Moore's Law set to continue

Posted by sengan on Friday September 22, @04:59PM
from the potential-lithography-breakthrough dept.

Chips are made by etching tiny wires and transistors onto a silicon substrate. The process used is lithography, which resembles photography: layers of special chemicals are added onto the silicon base. Shining light through a mask changes the properties of the layers where the light hits, allowing further treatment to produce transistors, wires, and other so-called features. Classical physics limits the size of features achievable with a given wave-length *lambda* to the Rayleigh diffraction limit of *lambda/2*. This is achieved by using optical interference. In 1999, Yablonovitch and Vrijen suggested using two-photon exposure techniques to increase this resolution. Their interference pattern contained a high frequency 4* term (allowing *lambda/4* sized features), but also a lower frequency 2* term of greater intensity which made it unusable for lithography. Now researchers at the JPL (USA) and the University of Wales (UK) have shown that using entangled photons removes the 2* term allowing features of *lambda/4* to be created. Their paper goes on to show that in general features as small as *lambda/2N* should be possible for N-photon absorbing substrates. Slashdot contacted one of the authors Jonathan Dowling who told us that experimental validation of these results is underway at UMD and is looking good. This means that Moore's law that the speed of chips will increase two-fold every 18 months will probably not encounter a limit due to lithography. Thanks to B1FFMaN for bringing the story to our attention, and to Jonathan Dowling for emailing us the article in advance of its publication.

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