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Look Out, Opto: Silicon Valley Startup Aims To Speed Copper Interconnections

by Mike Buetow, Editor in Chief

San Jose

As the hype surrounding optoelectronics reached a fever pitch last year, a Silicon Valley-based startup company has quietly been researching the incumbent – copper. And, says Silicon Pipe, a group of scientists and engineers, the death of copper has been very much exaggerated.

We believe that we can achieve signal speeds that will approach that of the speed of light,” says Para Segaram, co-founder and president. “The technology represents a fundamental change in thinking about how high speed interconnections can be achieved.

Copper has been assumed in some quarters to be too slow for high-speed applications such as datacom. Silicon Pipe says that most materials used in electronics having copper circuits are incapable of supporting higher speeds, and those materials with the capability come at significant cost. Yet copper skips the energy and time-wasting activity of converting electrons into photons and back to electrons, notes Silicon Pipe. The company, in recent experiments, has been able to modify conventional materials for greatly improved performance. It claims to have data showing how FR-4, which has a normal dielectric constant of 4.5, can be converted into a material structure having a dielectric constant of 2.8. This, Silicon Pipe says, should permit improved signal propagation velocity, while holding the line on system cost. The proprietary technologies, which are being patented, may be capable of even higher speeds, according to the developers.

A privately funded startup, Silicon Pipe boasts a founding group well-known in the electronics world. Segaram was founder and president of ASL Technologies (later sold to Rambus). Dr. Belgacem Haba was head of packaging research and development at Rambus. Joseph Fjelstad, is a noted innovator and author. Combined, they have more than 150 issued or pending patents.

Vice president of engineering Haba agrees. What we are doing is a significant departure from the current mainstream approach. We believe that copper interconnections are not only viable but also preferable as they get around energy and data latency problems associated with current optical solutions.

The company plans to license its technology and says it is holding discussions with several major OEMs.