Fiber optics in computer screens to save energy

February 22 2012, By Cécilia Carron

(PhysOrg.com) -- A single fiber-optic can light up computer screens. This innovation put in place by L.E.S.S., a recently formed spin-off of EPFL, brings energy savings of 30% while boosting processors.

“Slim as a hair, powerful as 100 LEDs”: the advantages of this technology have the allure of a slogan. “Currently, half the consumption of energy in laptops is connected to the screen and particularly its lighting,” explains Yann Tissot, the founder of the company, L.E.S.S. (Light Efficient SystemS). Transporting light through fiber-optics, as this newly created start-up wishes to do, permits the reduction of energy use by more than 30%.

Laptop screens are composed of different filters for colors and of a source of white light situated in the lower portion of the frame. With

LED, which is currently used, 60% of the light remains trapped inside these diodes and accounts for a significant loss in efficiency. The fiber optics developed by L.E.S.S. could bring just as much luminosity and contrast while conserving a quarter of the energy. “That liberated power could be used by the processor to gain speed,” adds the entrepreneur.

The fiber-optic resembles a simple wire of several microns in diameter, primarily composed of glass. Its secrete resides inside: a nanostructure permits the generation and guidance of white light to illuminate the screen in a uniform and efficient manner. But how does this system compare to organic light-emitting diodes (Oled), a new technology for flatscreens that doesn’t require a source of light? “The primary problem of this system is that the luminosity—and therefore the consumption—varies, depending on the color. Since the screen is primarily composed of white, itis illuminated at full tilt and therefore consumes three times more than a backlit LED system. But a laptop screen is permanently 70% white.” It’s also for this reason that this innovation is primarily directed toward computer screens, given that television requires a lower percentage of white as a result of its use for film viewing or TV shows—which are principally in color.

The technology developed by Yann Tissot and his colleague, Simon Rivier, opens the road to diverse applications. Initially it will be used to light elements under a microscope and could be in our computers four or five years from now. Given that fiber-optics permit the illumination of a surface both large and small; other applications are also being developed, notably for precision instruments in the fields of medicine and industry.

Provided by Ecole Polytechnique Federale de Lausanne