

## **ENHANCEMENT OF FRACTIONAL DELIVERY TECHNIQUE WITH PULSE ELONGATION, AGGRESSIVE SURFACE COOLING, AND SKIN SUCTION**

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**Background and Objective:** Fractional skin resurfacing is an established dermatological procedure. We have investigated opportunities for enhancing the approach by expanding the range of its operational regimes.

**Materials and Methods:** A modified Lux1540 laser handpiece for StarLux system (Palomar Medical Technologies, Inc.) was used. The modification allowed pulse durations up to 30 ms. A specially designed system cooled the output window down to 0 deg C. An attachment provided a vacuum down to 15 inches Hg. Fresh Yucatan skin was used in vitro for preliminary assessment of immediate tissue effects, followed by initial clinical tests.

**Results:** Histologically, columns of damage deeper than 1 mm could be obtained using long-pulse regime. Application of aggressive cooling in combination with high energy settings allowed vertical shift of columns of damage deeper into the tissue. Clinically, treatment with all three suggested modalities was well tolerated. Application of the suction attachment allowed to effectively increase density of columns up to ~ 20 %.

**Conclusions:** All three modalities can be used to enhance fractional treatment: 1) Very deep columns can be obtained with long pulses; 2) Aggressive cooling enables precise positioning of columns of damage; 3) Suction attachment allows effective increase in column density without sacrificing safety of treatment.