Human skin aging is characterized by skin laxity, photodamage, appearance of visible lines and wrinkles and an overall deterioration in skin texture. A decrease in collagen synthesis and architectural changes in the collagen fiber network cause the once-organized collagen fiber network to evolve into one that is disorganized with increased breakdown and reduced network formation.

The recent drive is to attain skin improvement with minimal adverse events and minimal downtime. In fractional resurfacing, thermally ablated microscopic zones of epidermis and dermis are spaced in a grid over the skin surface, where non-ablated zones serve as a reservoir of cells that promote rapid healing. Efficacy is higher than non-ablative, while safety and recovery times are better than ablative resurfacing.

The Sublative RF applicator is designed to deliver radiofrequency energy to the skin in a fractional manner, via an array of multi-electrode pins. The array delivers bi-polar RF energy to the skin (Figure 1).

The Bi-Polar RF Difference
When comparing the Sublative tissue effects vs. traditional laser tissue effects, there is a stark difference in the density of energy delivered deep into the dermis. RF current flow depends on the tissue’s conductivity (based on the water content.) Traditional fractional resurfacing (Figure 2), causes extensive epidermal damage with less damage to the dermis. Conversely, the Sublative bi-polar RF current, causes minimal epidermal damage just beneath the electrodes. The RF current then reaches the dermis, which is a conductive medium. The dermis’ natural resistance to the electrical current results in a unique current distribution (Figure 3); a strong focal heating effect just below the pins, with minimal epidermal damage, less heating and a more diffused effect in the dermis.

The Thermal Biological Effects of Sublative RF (Figure 4):
Ablation (Evaporation) –80 -100°C, when the pin tips are in direct contact with the skin, the very high heat at the contact point causes ablation of the epidermis at that contact point.
Coagulation (Necrosis) –50 - 80°C - the lower temperature in the dermis, below and around the ablation zone, causes destruction of chemical bonds, protein denaturation and metabolic effects resulting in skin tightening.
Heating (Stimulation) –40 - 50°C – below and around the coagulation zone the dermis is heated to a lower point where the heat stimulates collagenesis without tissue destruction.

References: