precise ultrasound to cause a visible and effective cosmetic results via a thermal pathway by using band shaped treatment focus zone techniques to expand the area and volume of tissue treated at a specific, targeted area.

According to a first aspect of the present invention, there is provided an ultrasound transduction system, comprising: a cylindrical transduction element; and a power source configured to drive the cylindrical transduction element, wherein the cylindrical transduction element is configured to apply ultrasonic energy to a linear focal zone at a focal depth, wherein the cylindrical transduction element comprises a first surface and a second surface, wherein the first surface comprises an electrically conductive coating, wherein the second surface comprises at least one electrically conductive coated region and at least one region that is not coated with an electrically conductive coating, wherein the at least one coated region on the second surface comprises a conductive material that forms an electrode when the power source is in electric communication with the at least one coated region, wherein the at least one coated region on the second surface is configured to reduce edge noise at the linear focal zone at the focal depth.

According to a second aspect of the present invention, there is provided a method of heating tissue with a cylindrical ultrasound transducer, comprising: providing a cylindrical transduction element comprising a first surface, a second surface, a coated region, and an uncoated region, wherein the coated region comprises an electrical conductor, wherein the first surface comprises at least one coated region, wherein the second surface comprises the uncoated region and a plurality of coated regions, applying a current to the coated region, thereby directing ultrasound energy to a linear focal zone at a focal depth, wherein the ultrasound energy produces a reduction in focal gain at the linear focal zone.

According to a third aspect of the present invention, there is provided a non-invasive, cosmetic method of heating tissue, comprising: applying a cosmetic heating system to a skin surface, wherein the cosmetic heating system comprises a hand-held probe, wherein the hand-held probe comprises a housing that encloses an ultrasound transducer configured to heat tissue below the skin surface to a tissue temperature in the range of 40 – 50 degrees Celsius, wherein the ultrasound transducer comprises a cylindrical transduction element comprising a first surface, a second surface, a coated region, and an uncoated region, wherein the coated region comprises an electrical conductor, wherein the first surface comprises at least one coated region, wherein the second surface comprises the uncoated region and a plurality of coated regions, applying a current to the plurality of coated regions, thereby directing ultrasound energy to a linear focal zone at a focal depth, wherein the ultrasound energy

produces a reduction in focal gain at the linear focal zone, thereby heating the tissue at the focal depth in the linear focal zone to the tissue temperature in the range of 40 – 50 degrees Celsius for a cosmetic treatment duration of less than 1 hour, thereby reducing a volume of an adipose tissue in the tissue.

Treatment can include heating, coagulation, and/or ablation (including, for example, hyperthermia, thermal dosimetry, apoptosis, and lysis). In various embodiments, band treatment provides improved thermal heating and treatment of tissue compared to diathermy or general bulk heating techniques. In various embodiments, band treatment provides the capability of heating and/or treating tissue at specific depth ranges without affecting proximal tissues. In general, diathermy and bulk heating techniques usually involve heating a skin surface and conducting the heat through the skin surface and all underlying tissue to reach a tissue at a target depth below the skin surface. In various embodiments, band treatment provides targeted heating and treatment at a specific, prescribed depth range below the skin surface without heating the skin surface and/or intermediary tissue between the skin surface and the target tissue. This offset band treatment reduces damage and associated pain at the skin surface, and treats tissue only at the prescribed, targeted tissue depth. Thus, embodiments of the present invention can be used to treat tissue in a specific range of depths below the skin surface without heating the skin surface. In some embodiments, band treatment can also be used to prepare tissue at target depths for a second, ultrasound treatment by pre-heating the target tissue to an elevated temperature so the secondary treatment can be performed with reduced time and/or energy and increased comfort.

[0005] In accordance with various embodiments, a cosmetic ultrasound treatment system and/or method can non-invasively produce single or multiple cosmetic treatment zones and/or thermal treatment points, lines, bands, belts, planes, areas, volumes, and/or shapes, where ultrasound is focused in one or more locations in a region of treatment in tissue at one or more depths under a skin surface. Some systems and methods provide cosmetic treatment at different locations in tissue, with treatment areas at various depths, heights, widths, and/or positions. In one embodiment, a method and system comprise a transducer system configured for providing ultrasound treatment to more than one region of interest, such as between at least two treatment positions and/or regions of interest. In one embodiment, a method and system comprise a transducer system configured for providing