

# Evaluating ICES® PEMF Technology for Hair Growth: A Scientific Review of the StimuField Cap System

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**"Recent advances in electromagnetic field therapy show promising applications in hair regeneration, with ICES® PEMF technology demonstrating potential for supporting natural hair growth processes through targeted electromagnetic stimulation."**

Recent developments in non-invasive hair growth technologies have led to the introduction of the StimuField™ Cap, a novel device utilizing ICES PEMF technology. This system represents an innovative approach to addressing hair growth concerns through controlled electromagnetic field application, offering a potential safe and effective alternative or complement to traditional treatments.

The device delivers precisely calibrated electromagnetic pulses through a wearable cap interface, with a recommended daily application of only 30 minutes. Current data suggest potential benefits in hair density and fullness.



**Figure 1:** The StimuField Cap technology is indistinguishable from the outside — it looks like a regular cap

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## Scientific Background: Electromagnetic Field Therapy in Hair Growth

There are currently many supplements, topical, and oral medications available for improving hair thinning and follicle health. However, the desire to improve results without using pharmaceuticals or systemic agents has led to the exploration of other therapeutic approaches, such as the use of biomedical or wellness devices. Pulsed electromagnetic field therapy (PEMF) devices are known to have a positive effect on skin and hair cells and have been shown to improve hair volume and density<sup>1,2,3</sup>.

PEMF supports hair production by upregulating enzymes and increasing the expression of cytokines and proteins. The main pathways involved are the Wnt/B-catenin signaling pathway<sup>4</sup> as well as the GSK3B/ERK/AKT Phosphorylation signaling pathway<sup>4,5</sup>.



**Figure 2:** A- The StimuField Cap includes an interface element featuring the single power button and LED indicators that provide information about the charge level. The interior includes a removable, washable inner liner made from breathable materials, allowing the user to clean the portion that comes into contact with the scalp. B- The StimuField Cap incorporates a flexible inner core and an adjustable back strap for a comfortable, adaptive fit. It also includes a magnetic charging port for easy and secure power connection.

### Technical Analysis of the StimuField System

The StimuField system employs patented ICES (Inductively Coupled Electrical Stimulation) technology, an advanced form of PEMF originally developed through NASA research by Dr. Robert Dennis. The technology has been adapted specifically for scalp application, with modifications to optimize electromagnetic field parameters for hair follicle stem cell stimulation.

The StimuField system's distinctive feature lies in its use of complex waveform patterns that appear to more closely approximate endogenous bioelectric signals, potentially offering advantages over conventional PEMF systems that utilize simpler waveforms.

These finely tuned signals generate microscopic magnetic fields that are designed to influence cellular activity without producing heat, enabling deeper tissue penetration at much lower intensities.

### Clinical Observations and Preliminary Results

Initial investigations of the StimuField system through a 24-week pilot study examining its effects on individuals with mild to moderate self-perceived hair thinning yielded several noteworthy observations:

Terminal hair density increased by 12.9 hairs/cm<sup>2</sup> at 16 weeks and by 23.3 hairs/cm<sup>2</sup> at 24 weeks.

67% of subjects reported fuller and thicker hair.

67% of subjects reported reduced hair shedding.

87% of volunteers reported increased hair volume.

While these current findings show promise, additional randomized controlled trials would help to further explore the efficacy of this approach. The observed results warrant further investigation into the potential of ICES PEMF technology for hair growth support.

### Technical Implementation

The technology is delivered through an ergonomically designed headwear device (Figure 1) incorporating precisely positioned coil arrays. The system's integrated battery provides approximately two weeks of daily sessions per charge, facilitating consistent application.

The device operates through a streamlined single-button interface, delivering controlled electromagnetic field exposure without thermal effects or tactile sensations (Figure 2). Small vibrations are provided solely to give user feedback at the beginning and end of the session. This design allows for consistent routine delivery while minimizing user error variables and offers a safer approach against overexposure.

### Accessibility and Adaptability

Because electromagnetic fields ignore melanin, results are not affected by hair colors, textures, and skin tones. StimuField cap comes in three cap sizes with an adjustable strap to ensure optimal scalp contact for everyone.

### Future Directions and Research Implications

The development of PEMF-based hair wellness technologies represents a promising direction in non-pharmaceutical approaches to hair growth support.

The StimuField system, the latest innovation of StimuSIL, a medical and wellness device company, represents an important step in translating electromagnetic therapy research into practical applications. Its design incorporates several key technical innovations, including optimized coil geometry for scalp coverage, flexible and portable design and precise field generation. While initial results are promising, continued investigation through larger-scale clinical trials will be essential to fully understand its potential.

"We remain dedicated to advancing the scientific understanding of electromagnetic field applications in hair wellness," states Dr. Scott Gerrish, Chief Medical Officer of StimuSIL. "Our ongoing research will continue to explore and refine these technologies while maintaining our commitment to evidence-based approaches."

The ongoing evaluation of this technology by health, aesthetic professionals, and researchers will be crucial in establishing its role in the broader context of hair wellness and thinning solutions, helping identify optimal application protocols and specific users who might benefit most from this approach.

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