Concept for Solid-State Mechanism Supporting Thermal Regulation of High-Temperature Ionized (+) Plasmas

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Introduction

Where high-temperature plasmas are required, engineers struggle with complications resulting from damage to components collocated with these plasmas. For a plasma to be ionized, it must first be rendered in the plasmic state prior to the removal of electrons from the plasma. As a plasma, hydrogen may be suspended and even circulated within a integument, however, even at relatively low densities, this plasma may cause overheating of collocated materials.

The low density of such plasmas means that they may be convected (magnetically,) but that little conduction can occur to support cooling, leading to the problem of overheating. A mechanism for effectively cooling these plasmas after ionization would extend the practical usefulness of low-density, high-temperature ionized plasmas.

Abstract

A solid-state mechanism consisting of a structured, negatively ionized crystal configured so that Coulomb Force Lines would extend at acute, near-parallel angles relative to the skin of the plasma envelope (pointing in the direction of plasma convection) should have the effect of, on the average, decreasing the temperature of protons in a hydrogen plasma given that the direction of convection can be controlled.

Design (Cooling Mechanism)

While thermal motion is generally Brownian, there is a greater-than-not probability in a convecting plasma that the presence of a Coulomb Force Line (-) will attract the proton as it makes its passage in a manner that has the net effect of a reduction of thermal motion provided that the Coulomb Force Lines and the direction of convection complement one another. The average result of repeated passages of said protons within an envelope nearby to (-) Coulomb Force sources would be the substantial reduction of the temperature of the plasma. If the flow direction were to be reversed, the structure would have the effect of increasing the temperature. For our purposes, we are only interested in achieving the practical cooling of these plasmas.

Although Coulomb forces are generally only measurable over distances of up to four atomic widths, recent research suggests clearly that precise alignments of positively or negatively charged ions can extend both the range and magnitude of this force over much greater distances. Key to success would be the selection of an ideal angle at which to orient the force lines relative to the skin of the envelope. That ideal angle would vary depending upon the distance across which the force may be exerted, with steeper angles being required the lesser the effectiveness of the solid-state Coulomb Force projection mechanism.

Force projection crystal structures should ideally be placed on either side of a given integument, however, where the desire is to reduce RADAR observability, this may not be practical, meaning that a single crystal layer must be utilized on the interior facet of the integument.

Design (Convection Mechanism)

For such a design to be practical, the plasma envelope must be kept a thin as possible. An ultra-thin envelope ensures both the proximity of the protons to the CF generation mechanism, but also ensures the effectiveness of a likely convection mechanism.

Plasmas, given their low density, cannot easily be circulated by conventional means such as a convector fan. Magnetic force must be used to ensure the overall movement of a plasma in a given direction throughout an envelope. As most applications call for the direction of motion of the protons to be parallel to the surface of the integument, a series of sub-convectors circulating around their own central CF source would be ideal. Protons would be simultaneously convected and cooled by the two distinct forces of magnetism and Coulomb Attraction.

Each of these sub-convectors would function much like a conveyor belt at any grocery store, except in our case, we are focused on the belt itself as the thing being conveyed. In the case of any conveyor belt, it spends half of its time being visible i.e. at the surface and the other half making the return journey just inches below. If we use a conveyor belt as an analogy, the space between the sections of our belt would contain our CF projection crystal as well as a mechanism for exerting magnetic force so as to act as a low-strength particle accelerator.

Conclusion

The more quickly the protons may be convected within their racetrack-shaped integuments, the more chances they have to be tugged backward by Coulomb forces and the more of a cooling effect may be achieved. The thinner the skin of the envelope, the greater the effect. As ionized plasmas are ideal for absorbing all forms of electro-magnetism, they are ideal for not only absorbing RADAR signals but for information security applications, as well sc. a superior alternative to copper-wire mesh. Such a cooling mechanism may also be used to increase the efficiency of ionic propulsion systems.