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# Hyperbolic blackbody

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The blackbody theory of Planck [1] is revisited in the case of thermal electromagnetic fields inside uniaxial anisotropic media in thermal equilibrium with a heat bath using the fluctuation dissipation theorem [2,3]. When these media are hyperbolic, we show that the spectral energy density of these fields radically differs from that predicted by Planck's blackbody theory. We demonstrate that the maximum of their spectral energy density is shifted towards frequencies smaller than Wien's frequency making these media apparently colder. Finally, using Rytov's fluctuational electrodynamics we derive Stefan-Boltzmann's law for hyperbolic media which becomes a quadratic function of the heat bath temperature. We discuss direct consequences for heat transport through vacuum [4] and through a hyperbolic medium [5].

# References

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