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PROCA ELECTRODYNAMICS AND "TIRED LIGHT"

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In an article on the "tired light" interpretation of cosmological red shifts, YOURGRAU and WOODWARD [1] implied that, under the "tired light" hypothesis, light propagates according to the Proca equations. They arrived at this conclusion by comparing factors describing exponential decay with distance, arising under the "tired light" hypothesis, with similar factors that occur in Proca electrodynamics. But the former factors refer to wave fields while the latter factors refer to static fields. Under the "tired light" hypothesis, electromagnetic waves in free space undergo an exponential decrease of frequency with distance. But the Proca equations have solutions corresponding to electromagnetic waves of fixed frequency [2], just as the Maxwell equations do. The features introduced by the Proca equations into free space propagation that are not implied by the Maxwell equations are dispersion of electromagnetic waves and the existence of longitudinal electric waves.

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