Chu and Ohkawa Respond: In their Comment on our paper,[1] Zaghloul, Volk, and Buchmaster[2] demonstrate once again the existence of $\mathbf{E}\parallel\mathbf{B}$ waves and give a general condition under which transverse electromagnetic waves with $\mathbf{E}\parallel\mathbf{B}$ exist. They point out correctly that $\mathbf{E}\parallel\mathbf{B}$ exists only for standing transverse electromagnetic waves and our recipe is not sufficient.

In addition to the $\mathbf{E}\parallel\mathbf{B}$ waves discussed in Ref. 1, there is a different family of $\mathbf{E}\parallel\mathbf{B}$ standing waves. They are of the form

$$\mathbf{A}(\mathbf{r},t)=f(\mathbf{r})\mathbf{G}(t).$$

It can be shown that if $\mathbf{G}(t)$ is a rotating vector about the direction of variation $\nabla f(\mathbf{r})$,

$$d\mathbf{G}/dt\propto\nabla f(\mathbf{r})\times\mathbf{G},$$

$\mathbf{E}$ and $\mathbf{B}$ are parallel to each other. An example[3] is a standing wave in vacuum with $\omega=kc$ and

$$\mathbf{A}(\mathbf{r},t)=\cos kZ(\hat{\mathbf{x}}\sin\omega t+\hat{\mathbf{y}}\cos\omega t),$$

$$\mathbf{E}(\mathbf{r},t)=-\frac{1}{c}\frac{\partial\mathbf{A}}{\partial t}=-k\cos kZ(\hat{\mathbf{x}}\cos\omega t-\hat{\mathbf{y}}\sin\omega t),$$

$$\mathbf{B}(\mathbf{r},t)=\nabla\times\mathbf{A}=k\sin kZ(\hat{\mathbf{x}}\cos\omega t-\hat{\mathbf{y}}\sin\omega t).$$

Both of the two classes of transverse electromagnetic $\mathbf{E}\parallel\mathbf{B}$ waves are standing waves, and the Poynting vector $\mathbf{S}=0$ everywhere and can be obtained from the method presented in the preceding Comment.[2]

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[1] C. Chu and T. Ohkawa, Phys. Rev. Lett. **48**, 837 (1982).

[2] H. Zaghloul, K. Volk, and H. A. Buckmaster, preceding Comment [Phys. Rev. Lett. **58**, 423 (1987)].

[3] This was pointed out by H. O. Girotti, J. Goedert, and J. R. Iglesias, Instituto de Fisica, Universidade Federal de Rio Grande do Sul, 90000 Porto Alegre, Rio Grande do Sul, Brazil.

