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Gerstner waves and Stokes Drift

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It is demonstrated that the vorticity in the Gerstner's wave in low-nonlinear order equals to the vorticity of the Stokes drift with opposite sign. As a result, the Stokes wave usually studied in the potential theory can be interpreted as the superposition of the Gerstner's wave and Stokes drift. The modulational instability of the Gerstner's wave trains is discussed.