Dark objects

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Summary

Dark objects are field excitations that are caused by point-shaped actuators. The carrier field reacts with shock fronts. The effect of these excitations is so tiny that in isolation these phenomena cannot be observed.

1 Defining dark objects

Dark objects are field excitations. Point shaped pulses generate these excitations. The effect of dark objects is so tiny that in isolation these objects can in no way be observed. And that includes detection by the most sophisticated equipment. That does not mean that these objects cannot become noticeable when they operate in huge coherent ensembles. In fact, all discrete objects in the universe are constituted by these dark objects.

Dark objects were already described theoretically more than two centuries ago. They are pulse responses that are solutions of second order partial differential equations.

Two second-order partial differential equations describe the behavior of dark objects.

$$\varphi=(\partial^2/\partial\tau^2 \pm \langle\nabla,\nabla\rangle)\psi$$

A third equation skips the first term

$$\varphi= \langle\nabla,\nabla\rangle\psi$$

In fact, these equations are quaternionic differential equations. Thus, φ and ψ are quaternionic functions that own a scalar real part and an imaginary vector part. The solutions are quaternionic functions.

The equation using the – sign is the quaternionic equivalent of the wave equation. The equation using the + sign splits into two quaternionic first order partial differential equations. This second equation does not offer waves as solutions.

The dark objects behave as shock fronts and operate only as odd dimensional field excitations. During travel, all shock fronts keep the shape of the front.

1.1 One-dimensional shock fronts

The one-dimensional shock fronts also keep their amplitude. Consequently, the one-dimensional shock fronts can travel huge distances without losing their properties. Combined equidistantly in strings they represent the functionality of photons. This means that the one-dimensional shock fronts are the tiniest possible packages of pure energy.

Depending on the PDE the solutions can be described by different equations. The solution for the wave equation is

$$g(\mathbf{q}, \tau)=f(c\,\tau \pm |\mathbf{q}-\mathbf{q}_{\circ}|)$$

This solution cannot represent polarization.

The solution for the other equation is

$$g(\mathbf{q}, \tau)=f(c\,\tau \pm |\mathbf{q}-\mathbf{q}_{\circ}|\,\mathbf{i})$$

The vector **i** can indicate the polarization of the shock front.

A photon is a string of equidistant energy packages that obeys the Einstein-Planck relation

$$E = h\,\nu.$$

Since photons possess polarization, they use the second solution for their energy packages. Thus, the constituents of photons are not solutions of the wave equation.

1.2 Green's function

One of the solutions of the Poisson equation is the Green's function

$$g(\mathbf{q})=1/|\mathbf{q}-\mathbf{q}_{\circ}|$$

$$\nabla g(\mathbf{q})=(\mathbf{q}-\mathbf{q}_{\circ})/|\mathbf{q}-\mathbf{q}_{\circ}|^{3}$$

$$\langle\nabla, \nabla\rangle\, g(\mathbf{q})= \langle\nabla, \nabla g(\mathbf{q})\rangle=4\pi\delta(\mathbf{q}-\mathbf{q}_{\circ})$$

Thus, the Green's function is a static pulse response under purely isotropic conditions.

1.3 Three-dimensional shock front

The three-dimensional shock fronts require an isotropic trigger. These field excitations integrate over time into the Green's function of the field. That function has some volume, and the pulse response injects this volume into the field. Subsequently, the front spreads the volume over the field. The corresponding solution of the wave equation is

$$g(r, t)=f(c\,\tau \pm r)/r$$

The parameter r is the radius of the spherical front.

Thus, the initial deformation quickly fades away. but the expansion of the field stays. Having the capability to deform the carrier field corresponds to owning a corresponding amount of mass. This means that temporarily, the spherical pulse response owns some mass. This mass vanishes, but the expansion stays.

A huge coherent recurrently regenerated swarm of spherical pulse responses can generate a significant and persistent deformation that moves with the swarm. This happens in the footprint of elementary particles. The spherical pulses are generated by the hop landing locations of the particle. The hopping path forms a hop landing location swarm that is described by a location density distribution. This distribution equals the square of the modulus of the wavefunction of the particle.

2 Less coherent ensembles of dark objects

Thus, the dark objects exist already as constituents of known objects. This does not forbid that these objects also occur spread in much less coherent ensembles. For example, a halo of spherical shock fronts around a star can cause gravitational lensing.

Physicists knew these objects for centuries, but they were neglected because, in isolation, these objects cannot be detected.

It is a shame that nowadays these dark objects still stay ignored. The equations that describe them can be found in books and papers that treat fundamental optics.

References

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