

## Matter and Antimatter

© 04/04/2008 Declan Traill  
[declan@netspace.net.au](mailto:declan@netspace.net.au)

To understand the construction of matter and antimatter particles it is useful (and probably essential) to use a three dimensional standing wave comprised of energy waves as a starting point.

The most basic 3D standing wave is comprised of two spherical waves of equal frequency; one travelling inwards, and the other travelling outwards. Each wave is formed as a reflection of the other in the combined waveform's nodes, which act like mirrors. This most basic structure is neutral as the inward wave's frequency is exactly the same as the outward wave's frequency. Placing two of these waveforms next to each other results in no electromagnetic force between them.

To add the properties of electromagnetism to the standing wave, we must construct the standing wave from two waves: inward and outward, as before, but with slightly different frequencies and amplitudes, such that the energies of the two waves is still identical. As the energy flow inwards & outwards is precisely matched, the particle persists and does not disintegrate. There is possibly additional stability to the structure provided by the vacuum, as I discuss in my paper titled "**Particle Stability in the Vacuum**".

When a 3D standing wave is comprised of slightly different frequency inward & outward waves, a slight spiralling – or spin – is required to stabilize the particle and create the conditions required to allow the two frequencies to 'lock' together and for the inward wave to become the outward wave upon reflection at the nodes – and vice versa. The frequency conversion is effected by Doppler shifts and direction changes from moving nodes.

Thus an electron and a positron can be modelled as two solutions to the problem of how to create a stable 3D standing wave of this type. In one case the inward wave spirals slightly into the centre and is reflected straight out from the centre; in the other the inward wave flows straight

into the centre and then spirals slightly on the way out. The two wave frequencies used to form a matter and antimatter particle pair (of the same particle mass and type) are the same, but their roles are reversed: ie in one case the slightly higher frequency wave is the inward wave, in the other it is the outward wave. The electromagnetic attraction/repulsion comes from the way the waves of two or more of these 3D standing waves add together when placed near one another. Each individual standing wave has a flow of phase (but no nett energy flow) inwards or outwards – in the direction of flow of the higher frequency energy wave component. See my paper titled “**The Mechanics of Charged Particles**” for a detailed explanation of how the attraction/repulsion force arises from this.

Constructing matter/antimatter particle pairs in this way gives the particles their required properties: both are made from positive energy, they have opposite charges, they have intrinsic spin, they are both effected by gravity in the same way, and they both have the ability to ‘unzip’ each other’s structures if they come in contact – resulting in the release of two high energy photons.

Interestingly, there is another way to comprise antimatter like properties – by subtracting energy of the same frequencies required to make the matter particle. This is seen with ‘holes’ in semiconductors that have properties similar to positrons, and are caused by a deficiency of electrons. It may be possible to subtract energy from the vacuum in this way to form antimatter particles too – but this way to form particles may not be stable.

#### References:

Traill Declan “**The Mechanics of Charged Particles**” The General Science Journal 15/07/2005

Traill Declan “**Particle Stability in the Vacuum**” The General Science Journal 04/03/2008