# Kaluza-Klein fields have two orthogonal components and two orthogonal sources.

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## Abstract

This is verifiable by inspection of the geometry of gravitational fields that have been constructed expressly to behave as electromagnetic fields and their sources would. This geometry consists of a field of red partitions and a field of blue partitions that are orthogonal everywhere. (These red and blue partitions are derived in my paper, “Draw the metric!”.) The sources for each Kaluza-Klein field are two dilation horizons that are at Cartesian right angles to each other. These sources are conserved by the Bianchi identities, that apply to them as a matter of definition. The orientations of the field of blue partitions and of its source are both necessarily slightly superluminal, and also almost orthogonal; the dilation horizon being almost parallel to the surface of the blue partitions. And the red partitions and their source are slightly subluminal. Together these components present a small gravitational field to spacetime objects that are not like Kaluza-Klein fields, but a very large magnitude of field is apparent to other Kaluza-Klein fields. Furthermore, in the presence of other Kaluza-Klein fields, the Kaluza-Klein fields and sources polarize in a push-me-pull-you manner so that the response of a Kaluza-Klein charge is far in excess of what external spacetime curvature justifies. Neglecting vacuum physics still allows a Kaluza-Klein emulation of an electron to be very close to Planck scale.

## Discussion

Is a word to the wise sufficient? Now really! A good description of the geometry is sufficient to establish the theory. The coordinate algebra is quite secondary – a distant translation.

But is this description accurate? Well yes, because single sources, as well as triple and higher sources, can not emulate the behavior of positive and negative charges.

Of course ordinary charges have their horizons oriented within a higher spacial dimension.

The subluminal dilation horizon is represented by a maximum density of red partitions, each showing the presence of an extra unit of spacetime interval when crossing it orthogonally. This is not different from ordinary gravitational fields; curvature toward the source happens at the edge of a red partition.

But the superluminal dilation horizon is represented by a maximum density of blue partitions, each showing a missing unit of spacetime interval when crossing it orthogonally. This is opposite to ordinary gravitational fields; curvature away from the source happens at the edge of a blue partition.

It is apparent from inspection that all positive charges have their red partitions in the same orientation, and also that negative charges have their blue partitions instead in almost that same orientation, albeit slightly superluminal along with their source rather than subluminal. (The spacelike part of this orientation is in a higher dimension for ordinary charges, of course.)

The cosine squared directionality of these red and blue partitions allow the dilation horizon sources of the charges to experience gravitational effects selected by the orientation or charge of the external Kaluza-Klein fields. The subluminal source of one charge does not experience the red field from an external charge of the same orientation or charge, because it is almost parallel to the surface of those red partitions. It experiences the effect of the blue partitions instead because it is almost perpendicular to those. And the superluminal dilation horizon of the charge in question experiences the effect of the external red partitions.

The external red partitions attract and the external blue partitions repel. (See my “Draw the metric!” paper.) The two dilation horizons of the charge in question then polarize to the point of greatly amplifying the external field. The subluminal source of the red field is repelled by the external blue field, and then repelled yet much more by the internal blue field. The superluminal source of the blue field is attracted by the external red field, but then is much more attracted in the opposite direction by the internal red field. So it is great push-me-pull-you fun to be had by inspecting this kind of geometry.

It is also great fun to work the algebra to solve for the scale of the geometry needed in the emulation of an electron by a Kaluza-Klein field. So I will leave it as an exercise. I make out the radii of the two dilation horizons to be .24 of the Planck length, and the push-me-pull-you amplification factor to be $5.8 \times 10^{21}$.

It is a matter of course that a correct quantization of spacetime should yield something close to quantum electrodynamics by way of this Kaluza-Klein model.