

## Some new Static Anisotropic Spheres

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In recent years, a number of authors have found solutions to the Einstein field equations for static gravitational fields with anisotropic matter. The models generated are used to describe relativistic spheres with strong gravitational fields. It is for this reason that many investigators use a variety of techniques to attain exact solutions. The exact solutions may be used to study the physical features of charged spheroidal stars. I found a new class of exact solutions to the Einstein field equation for an anisotropic sphere with the particular choice of the anisotropic factor  $\Delta = p_t - p_r$ , the difference between the radial and the tangential pressures of the fluid sphere and one of the gravitational potential  $Z$ . The condition of pressure anisotropy was reduced to a recurrence equation with variable, rational coefficients which can be solved in general. Consequently the exact solutions to the Einstein field equations corresponding to a static spherically symmetric gravitational potential was found in terms of series. I generated two linearly independent solutions by placing restriction on parameters arising in the general series. Some brief comments relating to the physical features of the model are also made.

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