Table 1. Real and imaginary parts of modified Bessel Green's function.

	$p=0.6$		$p=1.1$	
$(x-x_0)$	Re $G(x,x_0)$	Im $G(x,x_0)$	Re $G(x,x_0)$	Im $G(x,x_0)$
0.2	+0.5195 E+00	−0.3179 E+00	+0.2687 E+00	+0.1452 E+00
0.6	−0.2572 E−01	+0.1113 E+00	−0.1448 E−02	−0.1334 E−01
1.0	−0.1278 E−01	−0.1615 E−01	−0.4433 E−03	+0.3762 E−03
1.4	+0.3716 E−.02	+0.1959 E−04	+0.2426 E−04	+0.6752 E−05
1.8	−0.4216 E−03	+0.5214 E−03	−0.3474 E−06	−0.1034 E−05
2.2	−0.2595 E−04	−0.1182 E−03	−0.2862 E−07	+0.3758 E−07
2.6	+0.1958 E−04	+0.9665 E−05	+0.2043 E−08	+0.1132 E−09
3.0	−0.3568 E−05	+0.1669 E−05	−0.4558 E−10	−0.7599 E−10
3.4	+0.1670 E−06	−0.6909 E−06	−0.1617 E−11	+0.3481 E−11
3.8	+0.7853 E−07	+0.1014 E−06	+0.1641 E−12	−0.2661 E−13
4.2	−0.2314 E−07	−0.3660 E−09	−0.4942 E−14	−0.5237 E−14
4.6	+0.2660 E−08	−0.3219 E−08	−0.6768 E−16	+0.3044 E−15
5.0	+0.1538 E−09	+0.7377 E−09	+0.1256 E−16	−0.4971 E−17
5.4	−0.1213 E−09	−0.6147 E−10	−0.4834 E−18	−0.3295 E−18
5.8	+0.2233 E−10	−0.1016 E−10	−0.6654 E−22	+0.2534 E−19
6.2	−0.1086 E−11	+0.4292 E−11	+0.9101 E−21	−0.6134 E−21
6.6	−0.4228 E−12	−0.6367 E−12	−0.4411 E−22	−0.1773 E−22
7.0	+0.1441 E−12	+0.3797 E−14	+0.4362 E−24	+0.2012 E−23
7.4	−0.1678 E−13	+0.1987 E−13	+0.6154 E−25	−0.6454 E−25
7.8	−0.9095 E−15	−0.4604 E−14	−0.3809 E−26	−0.6383 E−27
8.2	+0.7512 E−12	+0.3908 E−15	+0.6968 E−28	+0.1521 E−27
8.6	−0.1397 E−15	+0.6181 E−16	+0.3760 E−29	−0.6194 E−29
9.0	+0.7041 E−17	−0.2666 E−16	−0.3134 E−30	+0.1572 E−31
9.4	+0.2962 E−17	+0.3997 E−17	+0.8081 E−32	+0.1086 E−31
10.0	−0.1524 E−18	−0.3495 E−18	+0.8386 E−34	+0.8933 E−34

free propagation because the propagation constant is purely imaginary.

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Non-existence of Maxwell fields in Bianchi type-V model in bimetric relativity

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Restricting to a particular type of the background metric it is observed that there is no contribution from Maxwell fields to the Bianchi type-V model in bimetric theory of gravitation.

To remove some of the unsatisfactory features of the general theory of relativity, Rosen[1] proposed the bimetric theory of relativity, in which there exist two metric tensors at each point of space-time—g_{ij}, which describes gravitation, and the background metric γ_{ij}, which enters into the field equations and interacts with g_{ij} but does not interact directly with matter. Accordingly, at each space-time point, one has two line elements

$$ds^2 = g_{ij}\,dx^i\,dx^j$$

and $$d\sigma^2 = \gamma_{ij}\,dx^i\,dx^j,$$

where ds is the interval between two neighbouring events as measured by a clock and a measuring rod. The interval $d\sigma$ is an abstract or geometrical quantity not directly measurable. One can regard it as describing the geometry that exists if no matter were present.

This note concludes that the Bianchi type-V model of bimetric theory of gravitation does not accommodate electromagnetic fields. This inference, however, does differ from that of general relativity[2].

The Bianchi type-V model is

$$ds^2 = e^{2a}(dx^2 - dt^2) + e^{2x}(e^{2b}dy^2 + e^{2c}dz^2), \quad (1)$$

where a, b, c are functions of t alone.
The background metric of flat space-time is

$$d\sigma^2 = dx^2 + dy^2 + dz^2 - dt^2. \quad (2)$$

[For $a=b=c=0$, the line element (1) takes the form

$$ds^2 = (dx^2 - dt^2) + e^{2x}(dy^2 + dz)^2, \quad (3)$$

which is not considered as the background metric because (i) it is not a flat space-time as its curvature tensor components R_{1212}, R_{1313} and R_{2323} are non-zero, and (ii) it is not a space of constant curvature as the relation

$$R_{hijk} = k(g_{ik}\, g_{hj} - g_{ij}\, g_{hk}), \quad (4)$$

where k is constant is not valid.]

The matter content with a source-free electromagnetic field is given by the energy momentum tensor

$$T_i^j = (\varepsilon + p)\, v_i v^j + p g_i^j + E_i^j \quad (5)$$

where

$$E_i^j = F_{ir} F^{jr} - \frac{1}{4} F_{ab} F^{ab} g_i^j. \quad (6)$$

Here p is the isotropic pressure, ε the matter density, E_i^j the electromagnetic energy tensor, F_{ij} the electromagnetic field tensor, and v^i the four velocities of the fluid which are so chosen that $v^1 = v^2 = v^3 = 0$ and $v^4 = e^{-a}$.

The non-vanishing components of F_{ij} are F_{12}, F_{13}, F_{24} and F_{34} such that

$$F_{12} = \pm F_{24} \quad (7)$$

and

$$F_{13} = \pm F_{34}. \quad (8)$$

For details one may refer to Roy and Singh[2].

The field equations of bimetric relativity

$$K_i^j = N_i^j - \frac{1}{2} N g_i^j = -8\pi k T_i^j \quad (9)$$

where

$$N_i^j = \frac{1}{2}\gamma^{\alpha\beta}(g^{hj} g_{hi|\alpha})_{|\beta} \quad (10)$$

$$N = N_\alpha^\alpha,\ k = (g/\gamma)^{1/2} \quad (11)$$

and the bar (|) stands for γ-differentiation.

$$8\pi k(p+\rho) = \frac{1}{2}(\ddot{b} + \ddot{c}) \quad (12)$$

$$8\pi k\, p = \ddot{a} - \frac{1}{2}(\ddot{b} - \ddot{c}) \quad (13)$$

$$8\pi k\, p = \ddot{a} + \frac{1}{2}(\ddot{b} - \ddot{c}) \quad (14)$$

$$8\pi k(\varepsilon + \rho) = -\frac{1}{2}(\ddot{b} + \ddot{c}) \quad (15)$$

$$8\pi k\, \rho = 0 \quad (16)$$

where $\dot{a} = \frac{da}{dt}$, $\ddot{a} = \frac{d^2 a}{dt^2}$, etc.

and

$$\rho = \frac{e^{2c} F_{24}^2 + e^{2b} F_{34}^2}{e^{2a+2b+2c+2x}} \quad (17)$$

Equations (7), (8), (16) and (17) imply that F_{12}, F_{13}, F_{24} and F_{34} are zero and consequently there is no contribution to the Bianchi type-V model from F_{ij} in bimetric theory of gravitation.

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Preparation and characterization of buckminsterfullerene and measurement of its heat of sublimation

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The recent discovery of an easy method for the production of all-carbon molecules C_{60} and C_{70} (called fullerenes) in macroquantities has led to a number of interesting investigations on the properties of these molecules and their derivatives. We have prepared these molecules and characterized them in our laboratory. The fullerenes were extracted from the graphite soot generated in an arc between two graphite electrodes by Soxhlet extraction. They were characterized by UV, visible and IR spectroscopy, high-performance liquid chromatography, X-ray diffraction and mass spectrometry. Column chromatography was used to separate C_{60} and C_{70}. Here we describe the procedures employed, and report data on heat of sublimation of C_{60} and C_{70} measured by high-temperature mass spectrometry.

THE preparation and isolation of macroscopic quantities of the all-carbon molecule C_{60} (buckminsterfullerene) by Kratschmer *et al.*[1] has opened up an exciting area of research. Though the actual practical applications of the fullerenes have not been identified yet, their chemistry promises to be a fascinating subject with many interesting possibilities.

Though polymeric carbon species were observed in the mass spectra of graphite from the fifties[2], the study of clusters existing in graphite soot received special attention only towards the eighties, when astronomers