principle an integral over a Cartan locus is varied by slipping the locus over the cylinder, points going along trajectories, while in the Hamilton principle the same expression is integrated along an arc of a trajectory and variation takes place by keeping the end points fixed but slipping the intervening path over the surface of a cylinder, points going over arcs of Cartan loci.

Finally, two points may be noted.

(1) From the form of (23) Whittaker's remarks which were cited follow as a corollary.

(2) Since (23) does not reduce to (16) as a special case, there are for the restricted conditions to which the original paper applies two different characterizing Hamilton extremal integrals.

THE UNIVERSITY OF ALBERTA

NOTE ON THE CANONICAL FORM OF THE PARAMETRIC EQUATIONS OF A SPACE CURVE BELONGING TO A NON-SPECIAL LINEAR LINE COMPLEX

BY C. R. WYLIE, JR.

In a recent paper,* the author, by means of a projection from hyper-space, obtained the following equations for a general curve belonging to a linear complex,

$$\text{A:}\qquad x_1 = -t, \qquad x_2 = f - \frac{1}{2} tf', \qquad x_3 = -f', \qquad x_4 = 1.$$

It is the purpose of this note to call attention to a more symmetric form of these equations.

Let $x_i = f_i(s)$ be the equation of a general space curve, and $P_{13} = P_{42}$ be the equation of a general linear complex. If the curve belongs to the complex

$$f_1f_3' - f_3f_1' = f_4f_2' - f_2f_4', \text{ or } \frac{f_1^2(f_1f_3' - f_3f_1')}{f_4^2 \cdot f_1^2} = \frac{(f_4f_2' - f_2f_4')}{f_4^2};$$

* C. R. Wylie, Jr., *Space curves belonging to a non-special linear line complex*, American Journal of Mathematics, vol. 57 (1935), pp. 937–942.

this last can be written in the form

$$\left(\frac{f}{f_4}\right)^2 \cdot u' = v',$$

where $u = f_3/f_1$ and $v = f_2/f_4$. From these we have at once

$$\text{B.1:}\quad f_1 = \left(\frac{v'}{u'}\right)^{1/2} \cdot f_4, \quad f_2 = v \cdot f_4, \quad f_3 = u\left(\frac{v'}{u'}\right)^{1/2} \cdot f_4, \quad f_4 = f_4,$$

$$\text{B.2:}\quad x_1 = (v')^{1/2}, \quad x_2 = v(u')^{1/2}, \quad x_3 = u(v')^{1/2}, \quad x_4 = (u')^{1/2}.$$

To show the equivalence of A and B.2, make the substitutions

$$\text{C.1:}\quad \left(\frac{v'}{u'}\right)^{1/2} = t, \qquad \text{C.2:}\quad \frac{df}{dt} = u\left(\frac{v'}{u'}\right)^{1/2} = ut.$$

From C.1 and C.2 we obtain after an easy integration by parts

$$\text{C.3:}\quad v = t \cdot \frac{df}{dt} - 2f.$$

Using these expressions in B.1 we find

$$\text{D:}\quad x_1 = t, \quad x_2 = tf' - 2f, \quad x_3 = f', \quad x_4 = 1,$$

where now the primes indicate differentiation with respect to t instead of s. The slight difference between D and A is due to the fact that in the paper mentioned above, the equation of the complex to which the curve belongs was taken to be $P_{13} + 2P_{42} = 0$.

OHIO STATE UNIVERSITY