



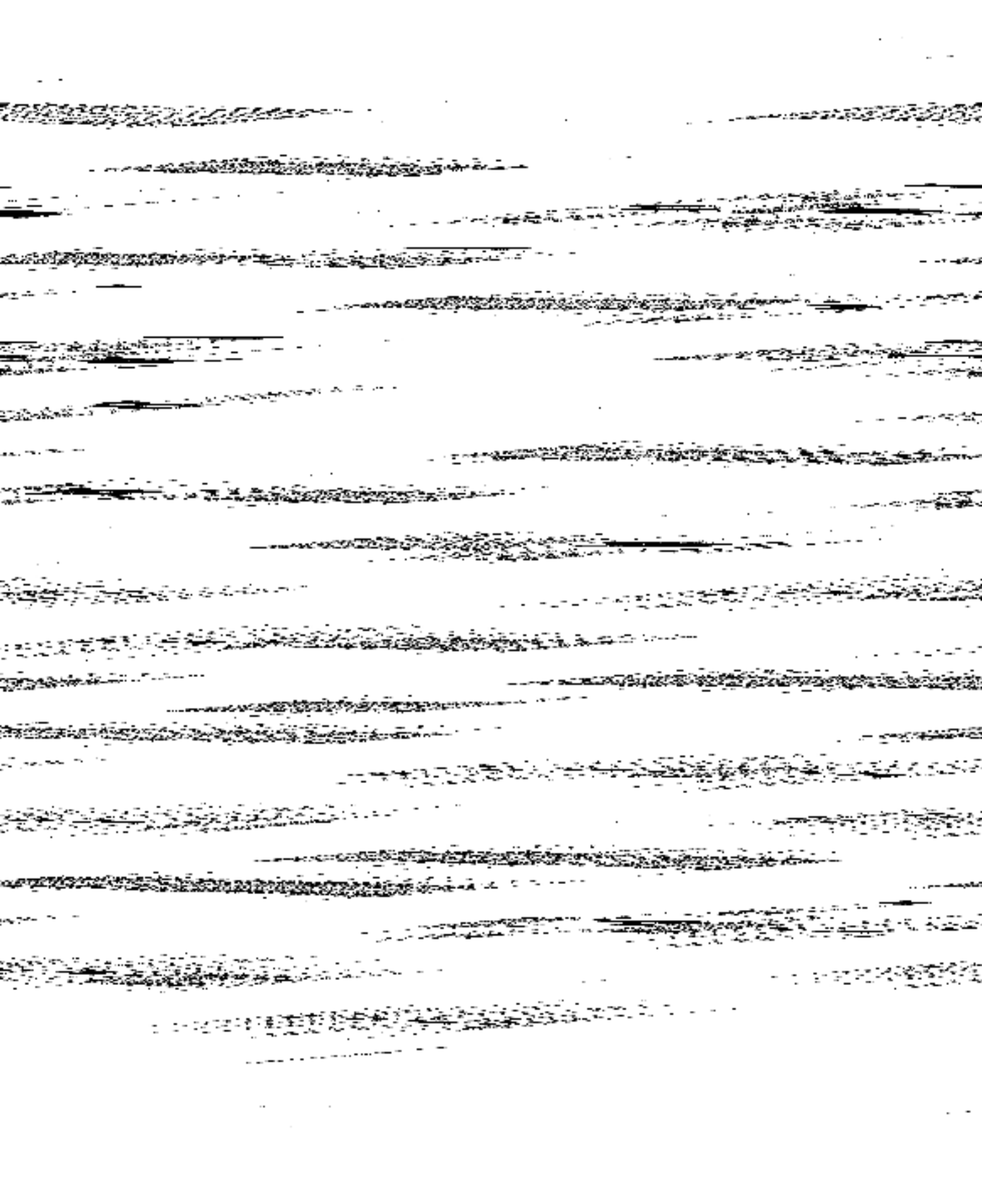


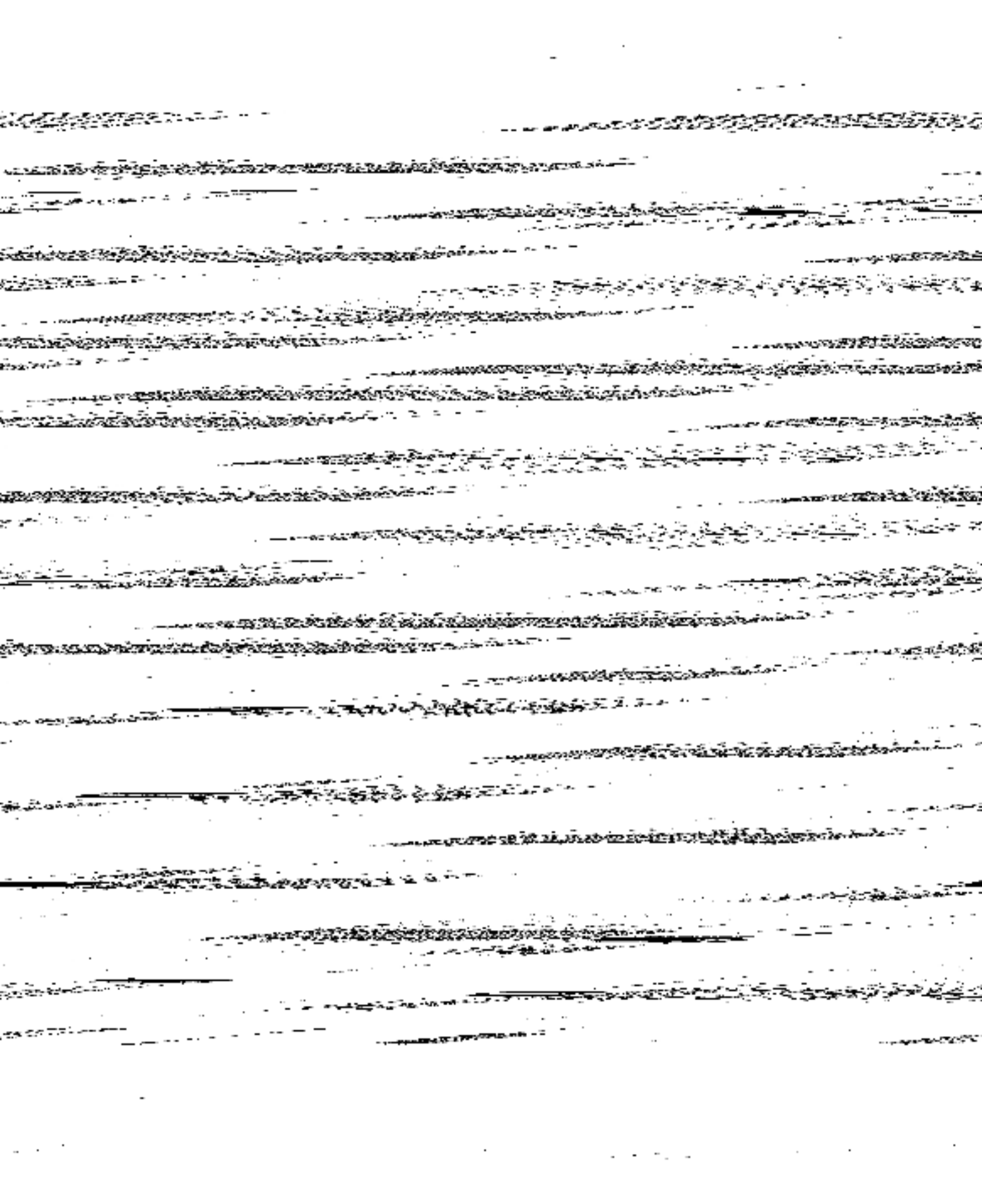
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$2 \sin^2 \psi = 1 - \cos 2\psi$, and $\frac{1}{\sqrt{1-c^2 \sin^2 \psi}} = \frac{1}{\sqrt{1+c'^2+2c' \cos 2\psi}}$, c'

being $= \frac{1-\sqrt{1-c^2}}{1+\sqrt{1-c^2}}$: these substitutions being made, we get

$$\frac{2\dot{\phi} \cos \phi}{\sqrt{1+c^2-2c \cos \phi}} = c \times \frac{(1+c')\dot{\psi}}{\sqrt{1+c'^2+2c' \cos 2\psi}} - c \times \frac{(1+c')\dot{\psi} \cos 2\psi}{\sqrt{1+c'^2+2c' \cos 2\psi}} + 2\dot{\psi} \cos \psi.$$

SUPPOSE NOW, $\frac{1}{\sqrt{1+c'^2+2c' \cos 2\psi}} = A' - B' \cos 2\psi + c' \cos 4\psi - \&c.$

it is evident, from what goes before, that, taking the fluents of the above fluxions, when ϕ and $\psi = \pi$, we shall have $B \times \pi$

$= c \times (1+c') \times (A' + \frac{B'}{2}) \times \pi$, and so $B = c \times (1+c') \times (A' + \frac{B'}{2})$.

THE values of A' and B' , in series according to the method of M. DE LA GRANGE, are

$$A' = 1 + \frac{1}{2} c'^2 + \frac{1 \cdot 3}{2 \cdot 4} c'^4 + \frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6} c'^6 + \&c.$$

$$\frac{1}{2} B' = (\frac{1}{2} c' + \frac{1}{2} \cdot \frac{1 \cdot 3}{2 \cdot 4} c'^3 + \frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6} c'^5 + \&c.)$$

which series converge very fast, on account of the smallness of c' in respect of c .

IF, however, it be required to find the value of B by series still more converging, we may easily do so: For it is manifest that B and B' are similar functions of c and c' : and that if we

make $c^o = \frac{1-\sqrt{1-c^2}}{1+\sqrt{1-c^2}}$, $c'' = \frac{1-\sqrt{1-c'^2}}{1+\sqrt{1-c'^2}}$, and so on, and put

A'' ,





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