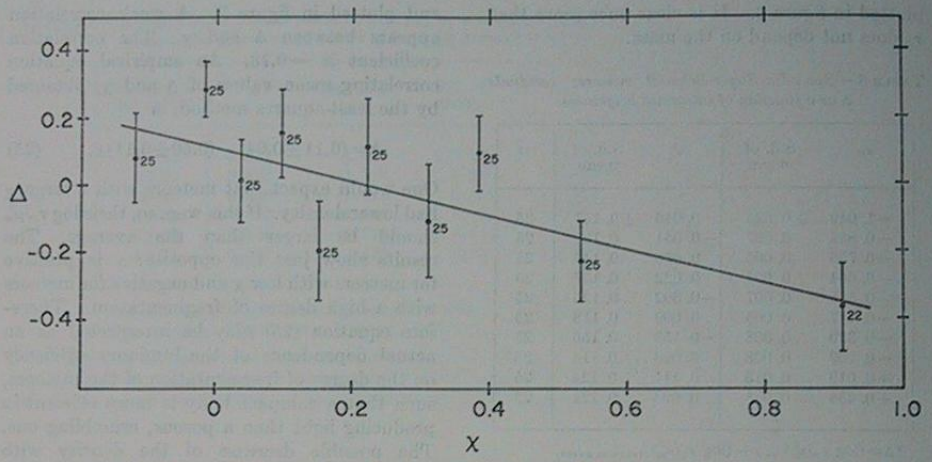

FIGURE 7.—Sporadic Super-Schmidt meteors: average residuals Δ for groups of meteors of different fragmentation. Straight line from a least-squares solution, $\Delta = (\log \tau_p/\rho_m^2)_{obs} - (\log \tau_p/\rho_m^2)_{least\text{-}squares}$. (See table 9.)

An explanation of the dependence of τ_p on χ could be found in the different density of the vapors in the meteoric coma. Low-fragmentation meteors should have a denser coma and radiation arising from the collisions among the molecules of the coma itself. Conversely, the radiation of the most crumbling meteors should be caused by collisions between air molecules and ablated meteor atoms. On the basis of such an explanation we should, however, also expect some dependence of τ_p on the mass. We could also explain the dependence by a difference of composition among the sporadic meteors such that low-fragmentation meteors contain a larger percentage of materials having a higher radiation efficiency than crumbling meteors do. This does not, however, seem very likely, as I pointed out for shower meteors in an earlier section. I must also remark that the residuals Δ are strongly affected by all the causes of error previously mentioned (observational errors, fluctuations in the atmosphere, irregularities in the shape, differences in density of the meteoroids, and so on) and that some error is also present in the values of χ, as is shown by the number of meteors having $\chi < 0$. Therefore the validity of equation (25) must be considered with caution.

A clearer correlation also exists between mean values of Δ and log σ, σ being the coefficient of the mass equation

$$\frac{\dot{m}}{m} = \sigma v \dot{v}. \tag{26}$$

The results, contained in table 10, are plotted in figure 8. The regression line is

$$\Delta = (-7.03 \pm 1.45) - (0.63 \pm 0.13) \log \sigma, \tag{27}$$

TABLE 9.—*Sporadic Super-Schmidt meteors: residuals Δ as a function of the fragmentation index χ.*

χ	S.d. of mean	Δ	S.d. of mean	no.
−0.122	±0.014	0.082	±0.132	25
−0.018	0.003	0.281	0.082	25
0.036	0.004	0.016	0.120	25
0.096	0.004	0.153	0.132	25
0.149	0.003	−0.197	0.146	25
0.222	0.005	0.116	0.140	25
0.309	0.005	−0.111	0.164	25
0.383	0.005	0.091	0.112	25
0.532	0.015	−0.232	0.118	25
0.909	0.052	−0.368	0.124	22

Correlation coefficient between mean values of Δ and $\chi = -0.73$.