Northwest Atlantic   Fisheries Organization

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Regressions of Weight on Length of Witch Flounder (*Glyptocephalus Cynoglossus*)

in the Eastern Newfoundland Area (NAFO Divisions 2J+3KL)

by

W. R. Bowering and D. E. Stansbury
Fisheries Research Branch, Department of Fisheries and Oceans
P. O. Box 5667, St. John's, Newfoundland, Canada A1C 5X1

Introduction

An important routine in stock assessment is deriving the numbers of fish removed from a population by converting the commercial landings from weight to actual numbers at age. The relationship between length and weight of a given species is, therefore, a critical parameter in performing this routine. This paper will document these relationships for both round weights and gutted weights of witch flounder for the eastern Newfoundland area.

Materials and Methods

Random samples of witch flounder were collected during stratified-random research surveys conducted by Canadian research vessels in NAFO Div. 2J, 3K, and 3L. A summary of the sampling is presented in Table 1. The samples were frozen and brought back to the laboratory where they were measured from the tip of the snout to the end of the caudal fin ray in centimeters. They were then weighed to the nearest gram for total weight and gutted weight.

Least squares regression equations were calculated as derived from the logarithmic transformation (base 10) where $Y = \log$ weight (kg) and $X = \log$ length (cm). Equations were calculated for data from each NAFO Division separately, as well as combined, for both length vs. round weight and length vs. gutted weight.

Results

A summary of the regression analyses is presented in Table 2. For each analysis a plot of the actual data is shown, as well as a plot of the transformed data with regression line and 95% confidence limits. Plots for Div. 2J are shown in Fig. 1-4, for Div. 3K, Fig. 5-8, for Div. 3L, Fig. 9-12, and for all areas combined, Fig. 13-16. All regressions were significant at the 0.01% level (Table 2).

Table 1. Summary of samples collected for length-weight relationships in witch flounder.

| Ship	NAFO division	Dates collected	No. sampled
GADUS ATLANTICA	2J	October 31-November 13, 1982	55
GADUS ATLANTICA	3K	November 20-December 7, 1982	81
WILFRED TEMPLEMAN	3L	October 30-31, 1982	10
A. T. CAMERON	3L	November 9-December 2, 1982	95
Total			241

Table 2. Summary of regression analyses of log length vs. log weight of witch flounder.

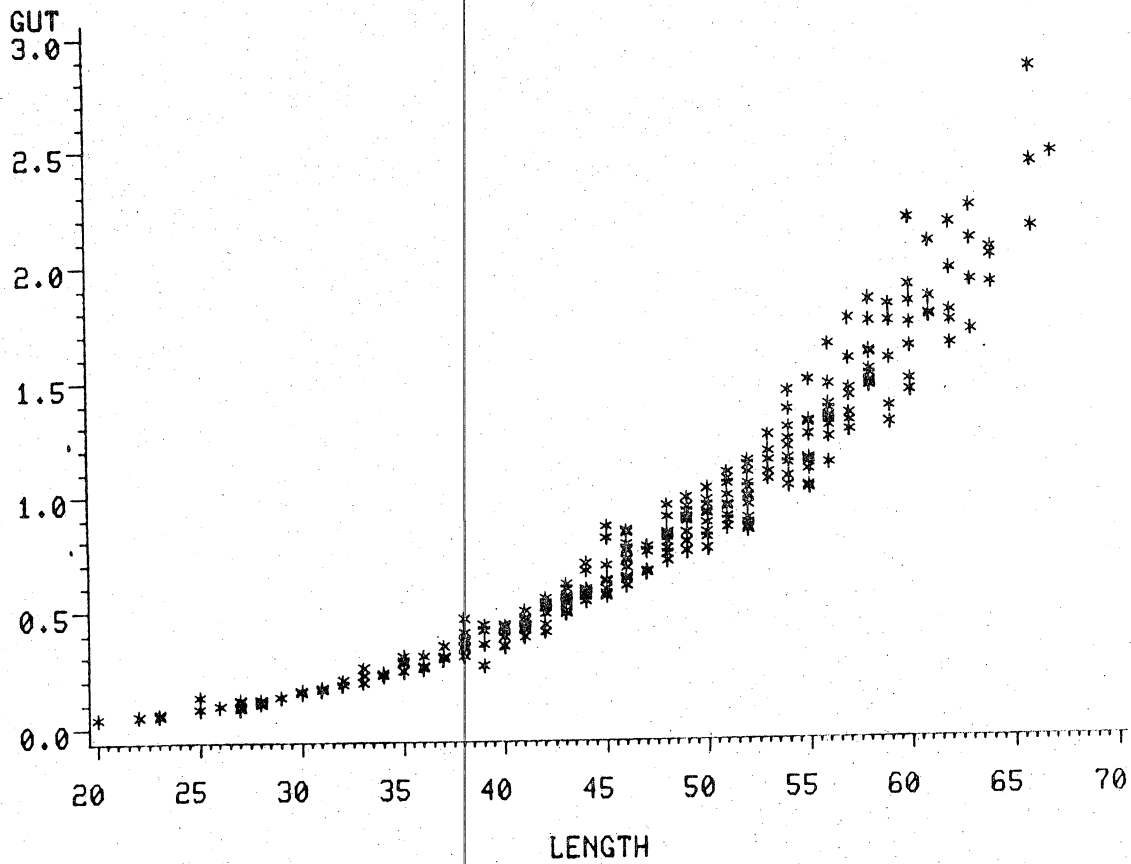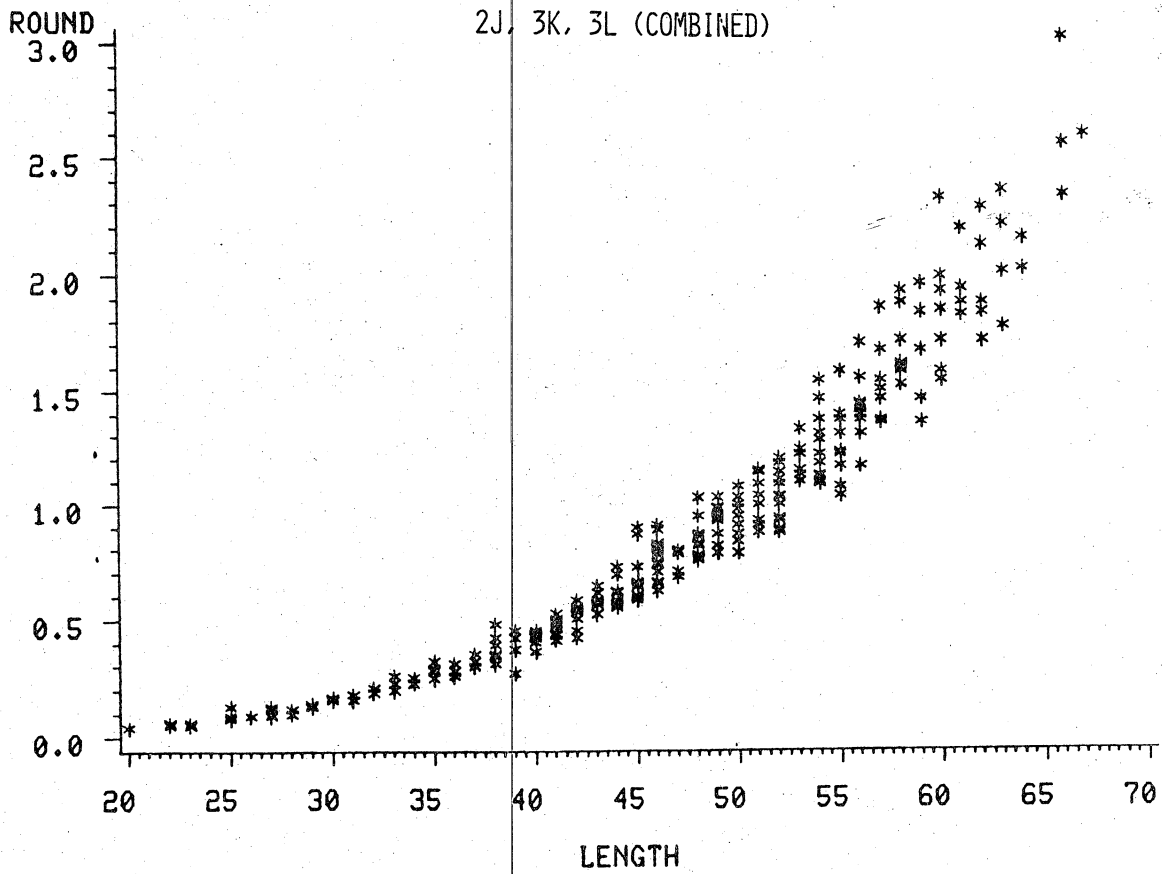| Weight type	Division	Int.	Slope	R^2	F. value	p>F	Untransformed equation (kg)
Round	2J	-5.7678	3.3873	0.96	1215.5	0.0001	$W = 0.00000171 \; L^{3.3873}$
	3K	-6.0948	3.5649	0.98	4804.8	0.0001	$W = 0.00000080 \; L^{3.5649}$
	3L	-5.8182	3.4131	0.95	1844.7	0.0001	$W = 0.00000152 \; L^{3.4131}$
	All areas combined	-5.9653	3.4970	0.97	7220.0	0.0001	$W = 0.00000108 \; L^{3.4970}$
Gutted	2J	-5.7684	3.3737	0.96	1252.5	0.0001	$W = 0.00000170 \; L^{3.3737}$
	3K	-6.1159	3.5647	0.98	4961.3	0.0001	$W = 0.00000077 \; L^{3.5647}$
	3L	-5.8343	3.4077	0.95	1876.3	0.0001	$W = 0.00000146 \; L^{3.4077}$
	All areas combined	-5.9835	3.4938	0.97	7484.2	0.0001	$W = 0.00000104 \; L^{3.4938}$

DIV=2J

DIV=2J

LENGTH

LENGTH

DIV=3K

DIV=3K

DIV=3L
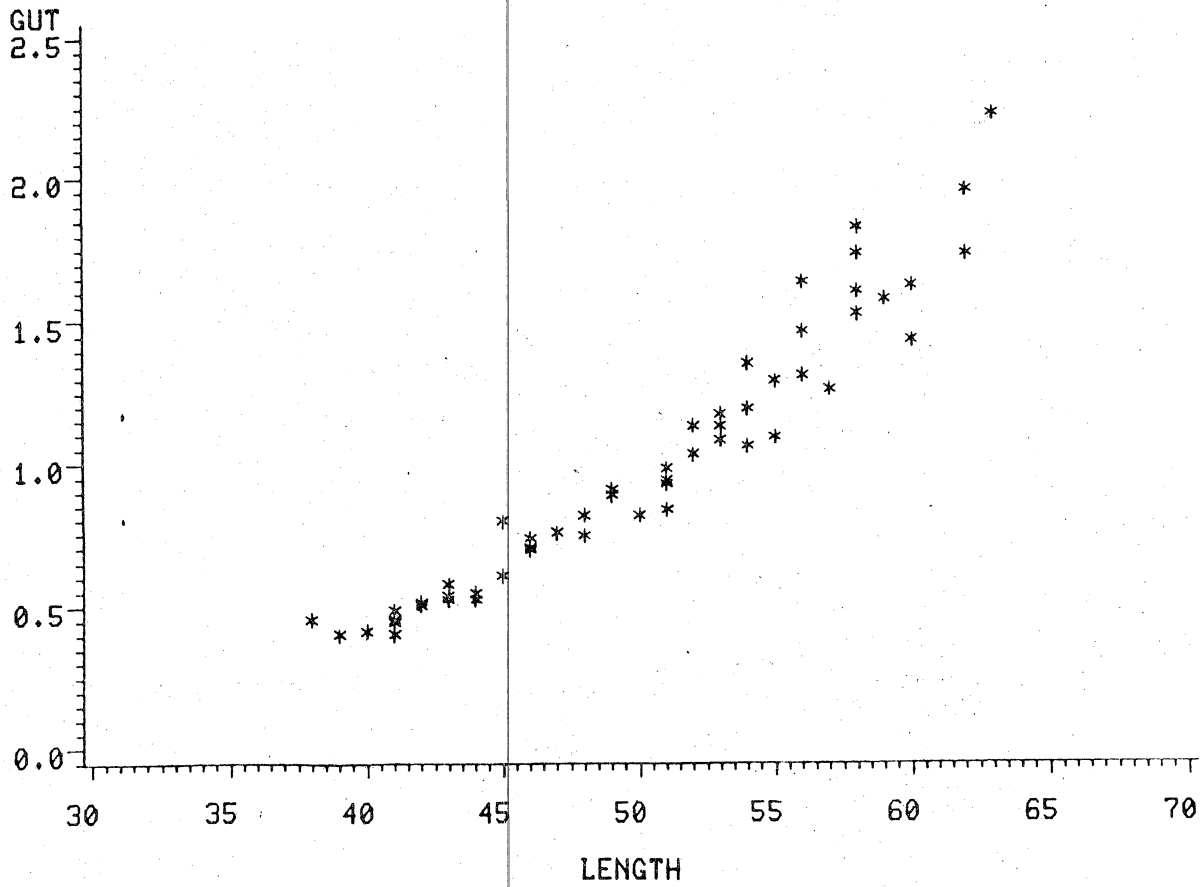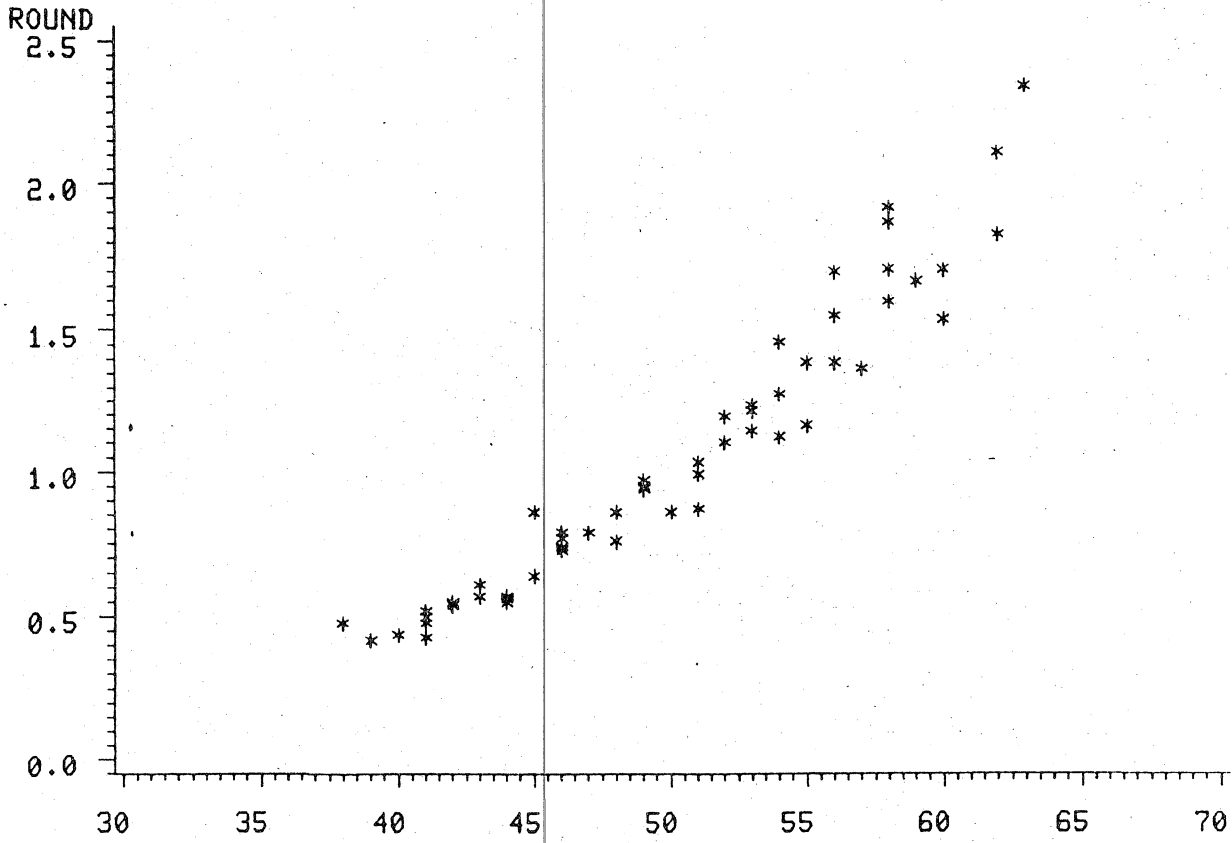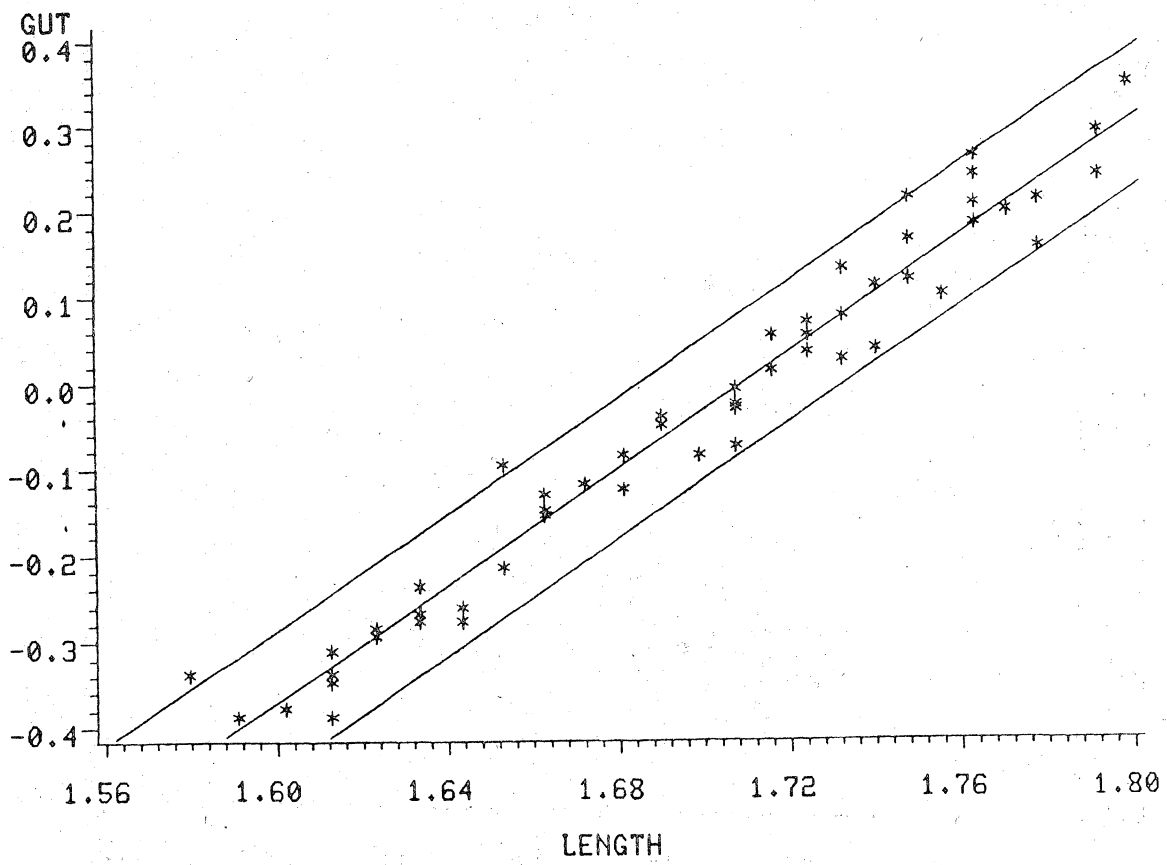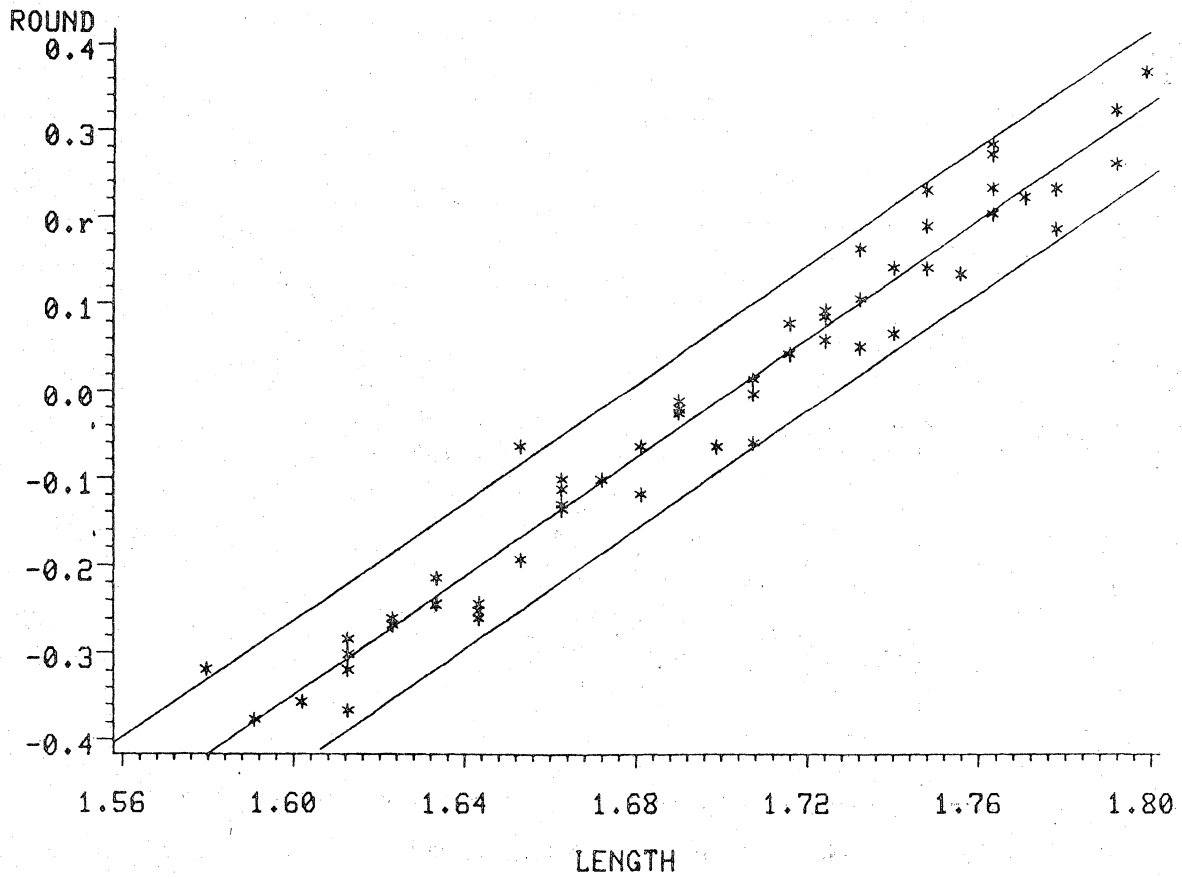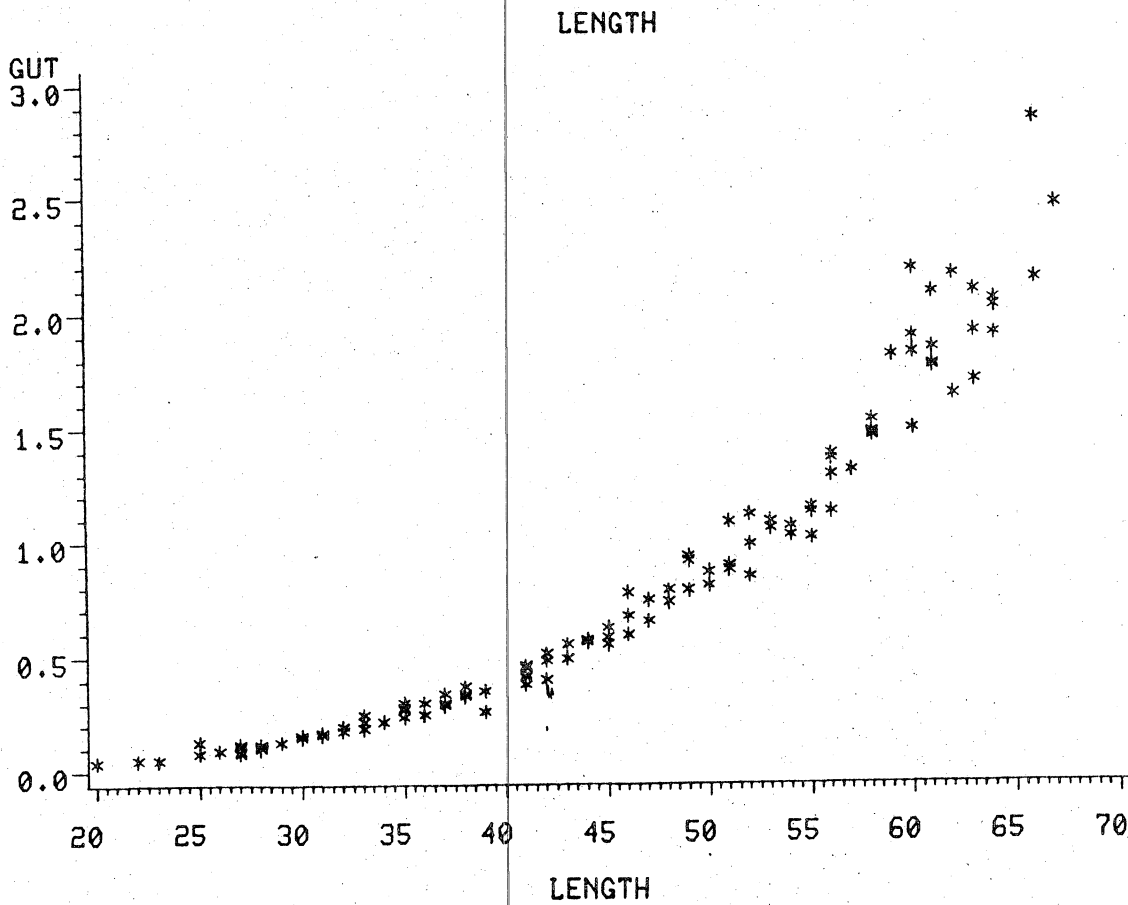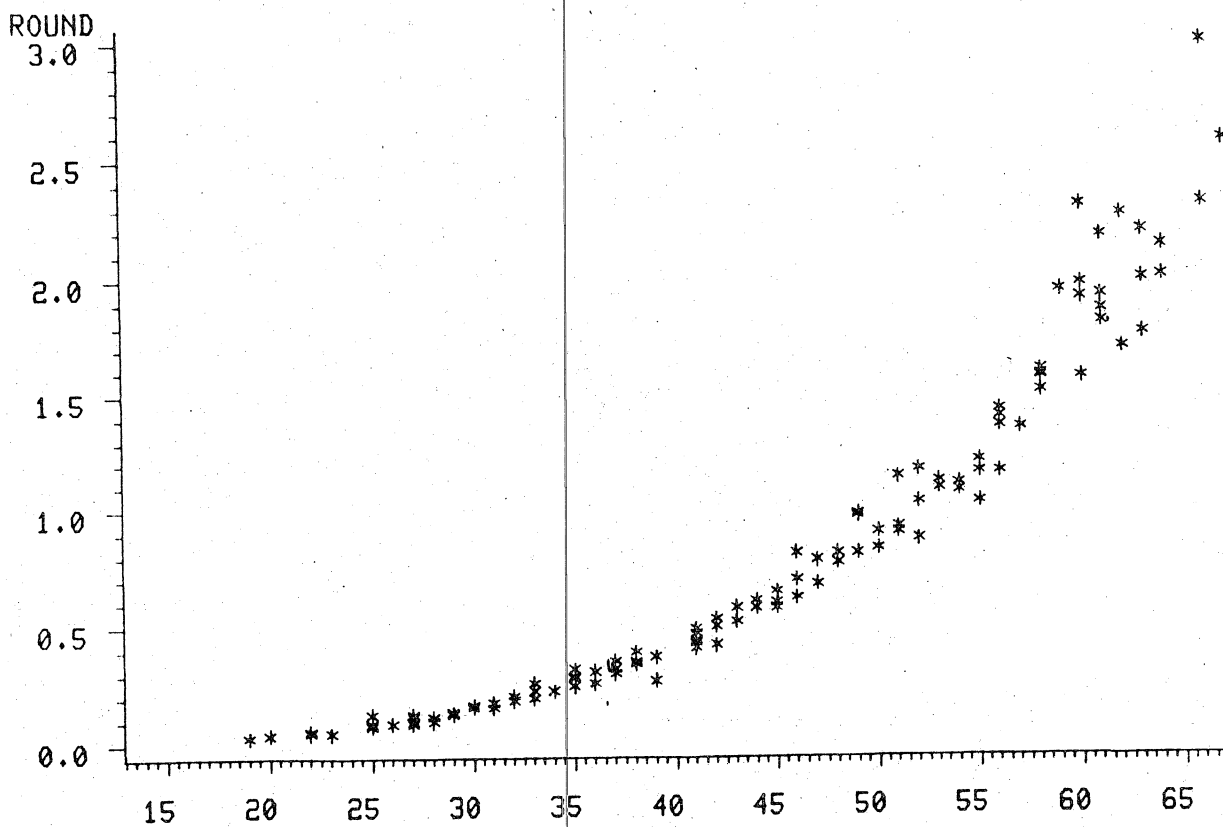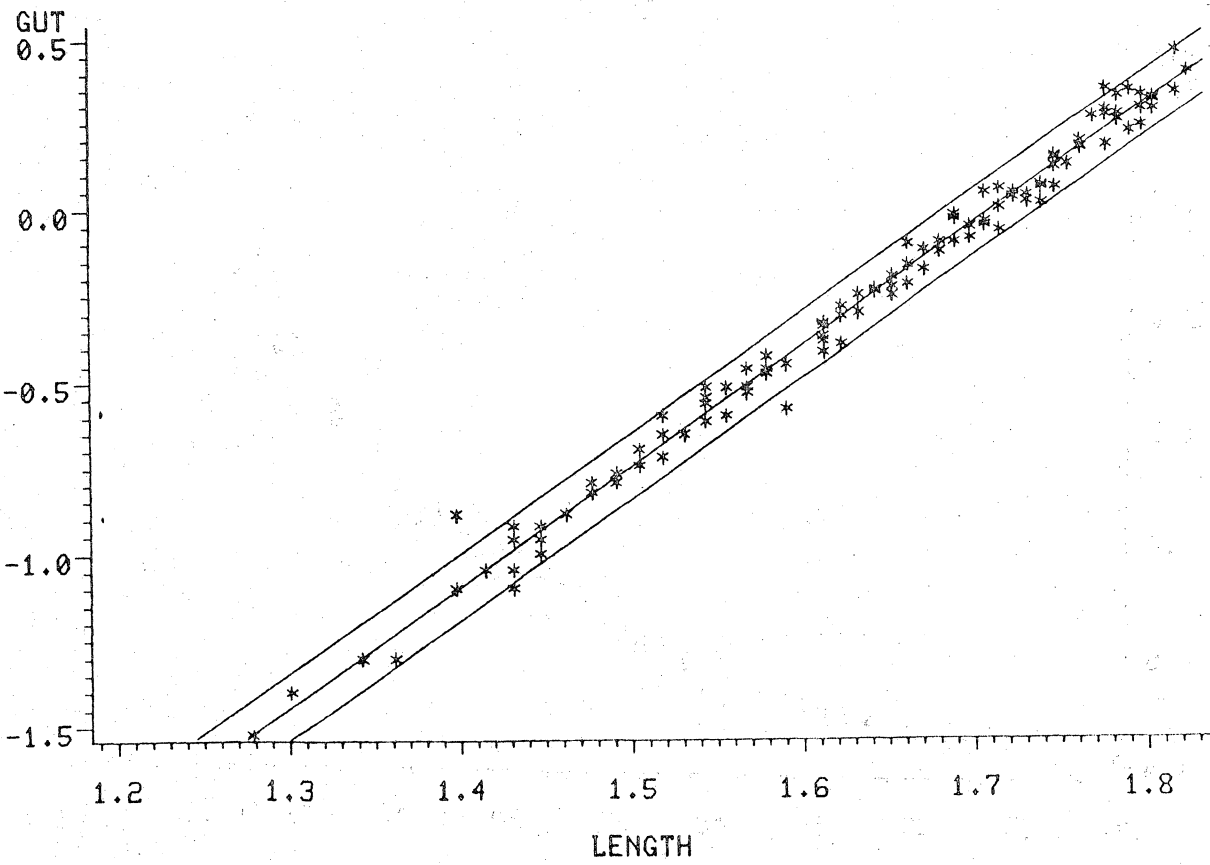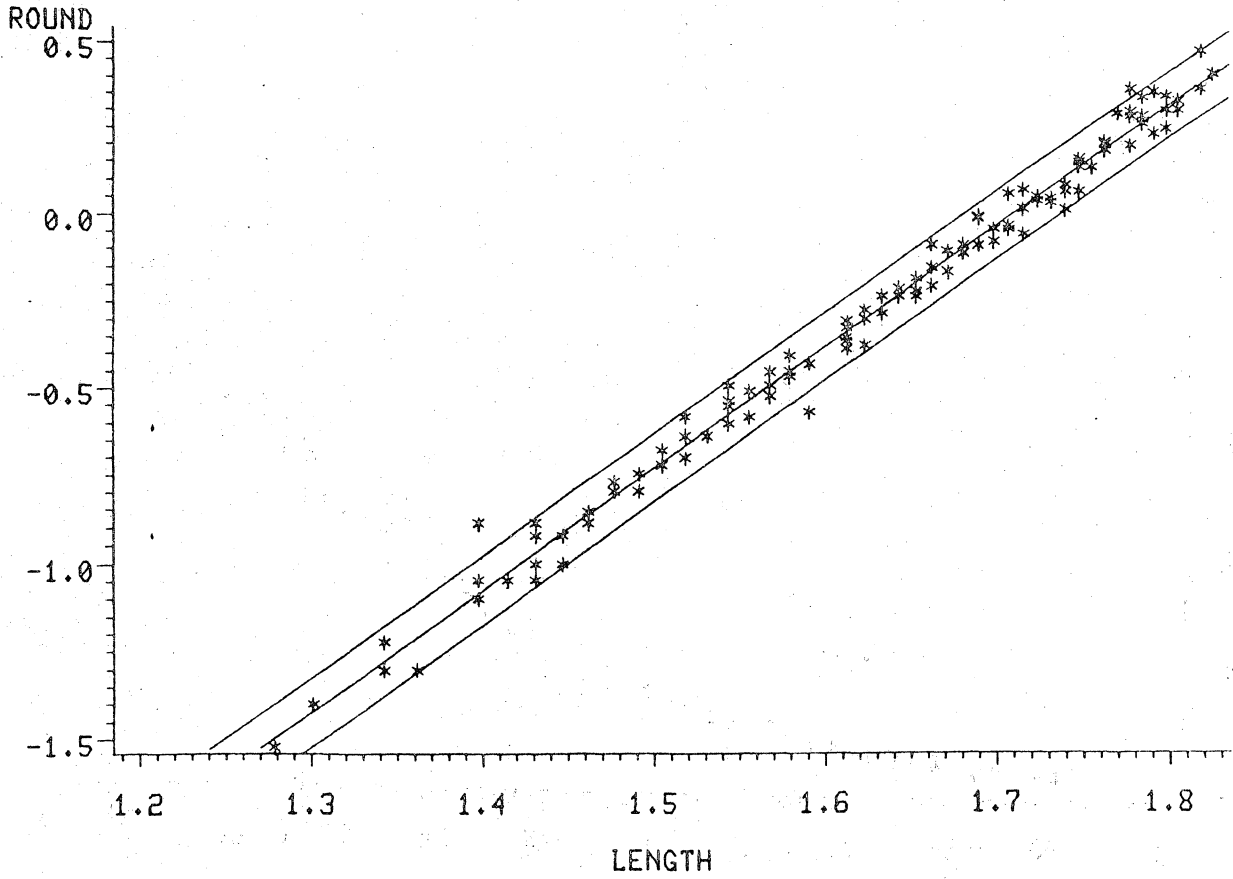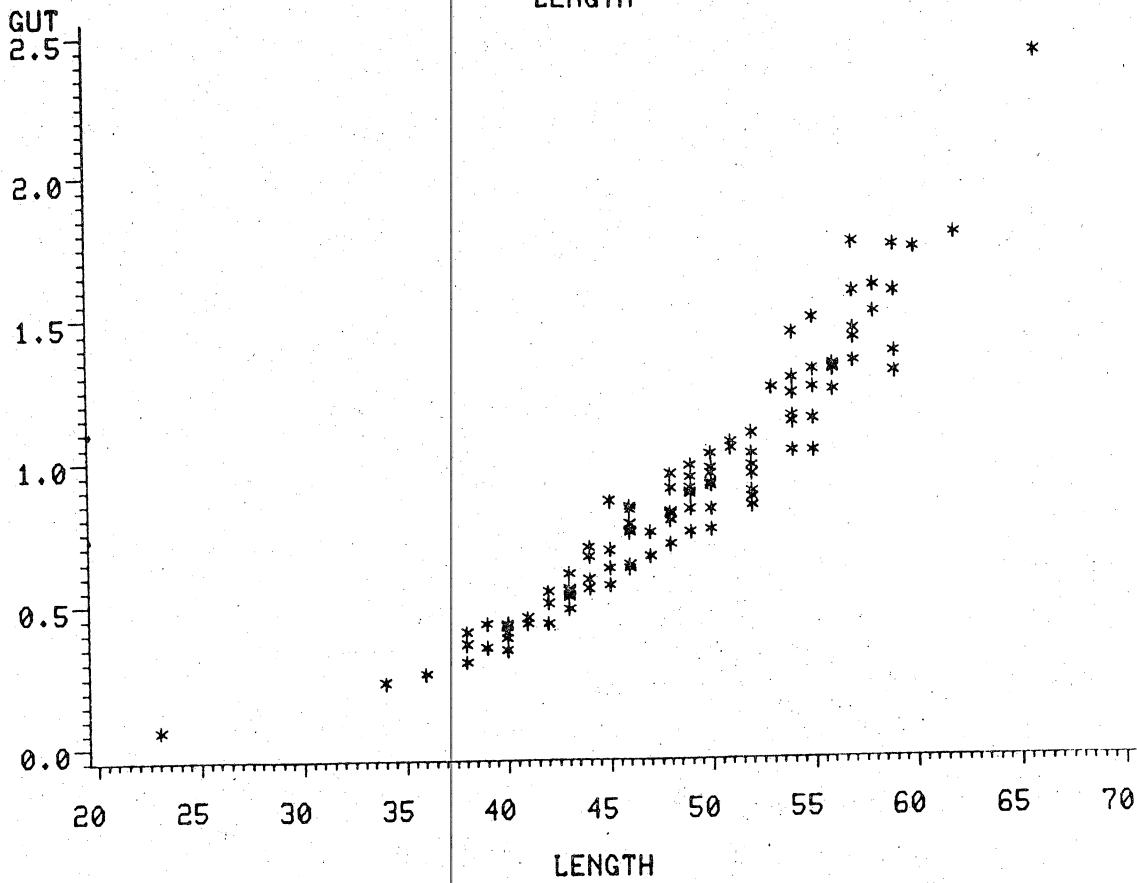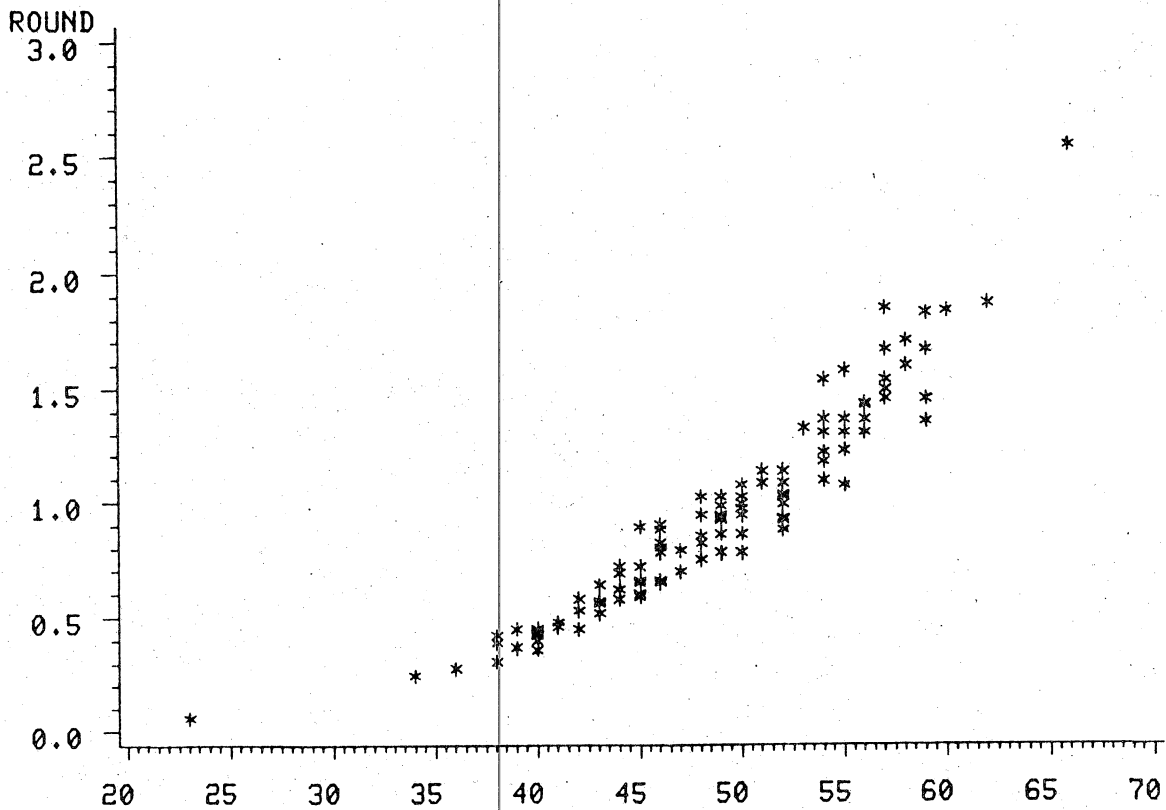
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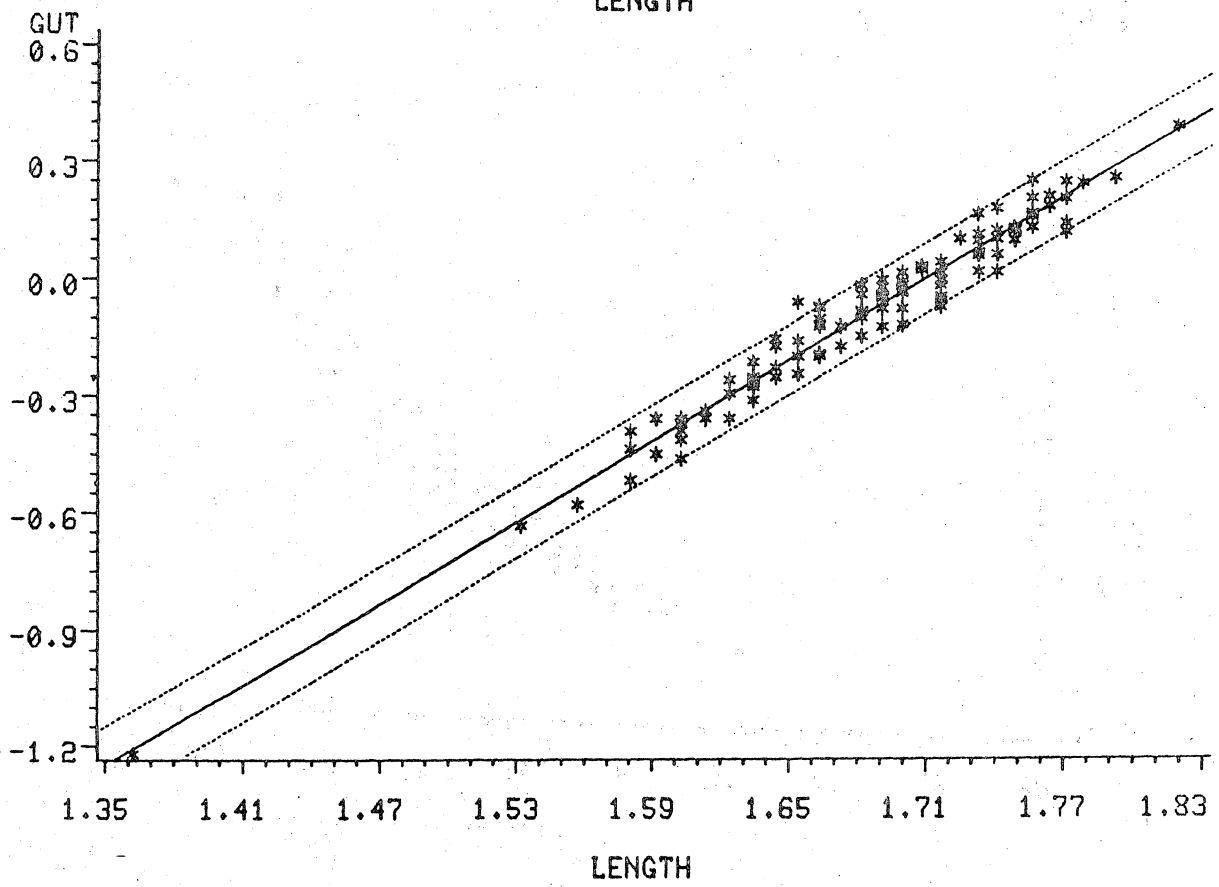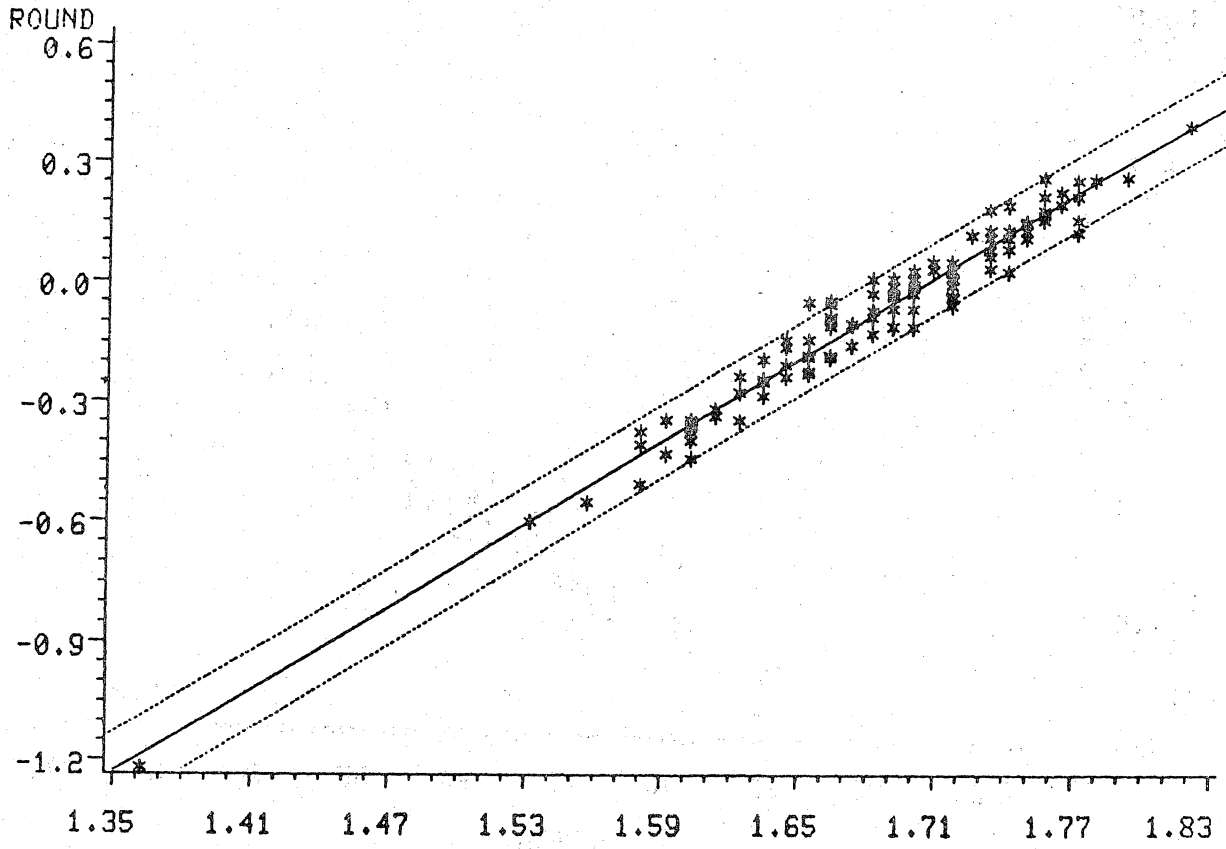
2J, 3K, 3L (COMBINED)

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