

# Technical Report 01:16. Tables from “Robust projection indices”

Guy P. Nason <sup>1</sup>

*University of Bristol, UK*

[Dec 28, 2000]

**Summary.** This document contains four tables which contain the switch points corresponding to the perspective plots from the paper “Robust projection indices” by G.P. Nason in *Journal of the Royal Statistical Society, Series B*, (2001) **63** 551–567.

*Keywords:* Exploratory projection pursuit; Divergence from Student's  $t$ ; Moment index; outlier contamination

## 1 Switch points for moment indices

Tables 1 to 4 show, for various cluster separations and truncation points, switch points of Friedman's moment based index from Friedman (1987b), Hall's moment index from Hall (1989), the natural Hermite (nH) moment index from Cook, Buja and Cabrera (1993) and our Student's  $t$  orthogonal expansion index given by (7). In all the tables the values of the switch points do not increase noticeably for truncation points higher than that given in the last row of each table.

---

<sup>1</sup>*Address for correspondence:* Department of Mathematics, University Walk, University of Bristol, Bristol, BS8 1TW, England  
E-mail: G.P.Nason@bristol.ac.uk

Table 1: Switch points for Friedman’s (1987b) moment index for various cluster separations and number of terms in the approximation (truncation point).

Trunc.	Cluster Separation								
	4	4.5	5	5.5	6	6.5	7	7.5	8
2	9.6	10.4	11.1	11.7	12.2	12.6	12.9	13.2	13.5
3	9.6	10.4	11.1	11.7	12.1	12.6	12.9	13.2	13.4
4	18.9	22.1	25.2	28.0	30.7	33.1	35.4	37.5	39.4
5	18.9	22.1	25.2	28.0	30.6	33.0	35.2	37.2	39.1
6	19.1	22.3	25.4	28.1	30.7	32.9	35.0	36.8	38.4
7	19.1	22.3	25.4	28.1	30.7	32.9	34.9	36.7	38.3
8	19.2	22.5	25.8	29.0	32.2	35.3	38.3	41.2	44.0
9	19.2	22.5	25.8	29.0	32.2	35.3	38.3	41.2	44.0
10	19.2	22.5	25.8	29.1	32.3	35.3	38.3	41.2	44.0
15	19.2	22.5	25.8	29.1	32.3	35.4	38.5	41.6	44.6
20	19.2	22.5	25.8	29.1	32.3	35.4	38.5	41.6	44.7

## References

- Cook, D., Buja, A. and Cabrera, J. (1993) Projection pursuit indices based on expansions with orthonormal functions. *J. Comput. Graph. Statist.*, **2**, 225–250.
- Friedman, J.H. (1987b) Exploratory projection pursuit. *J. Am. Statist. Ass.*, **82**, 249–266.
- Hall, P. (1989) On polynomial-based projection indices for exploratory projection pursuit. *Ann. Statist.*, **17**, 589–605.
- Nason, G.P. (2001) Robust projection indices. *J. R. Statist. Soc. Series, B*, **63**, 551–567.

Table 2: Switch points for Hall's (1989) moment index for various cluster separations and number of terms in the approximation (truncation point).

Trunc.	Cluster Separation								
	4	4.5	5	5.5	6	6.5	7	7.5	8
1	8.5	9.2	9.7	10.1	10.5	10.8	11.1	11.3	11.5
2	13.8	15.1	16.3	17.4	18.3	19.0	19.7	20.3	20.8
3	13.8	15.1	16.3	17.3	18.2	19.0	19.6	20.2	20.7
4	18.3	20.6	22.7	24.7	26.5	28.1	29.6	30.9	32.1
5	18.3	20.6	22.7	24.6	26.4	28.0	29.4	30.8	32.0
6	19.7	22.5	25.1	27.5	29.7	31.8	33.7	35.4	37.1
7	19.7	22.5	25.1	27.5	29.7	31.7	33.6	35.3	36.9
8	20.1	23.0	25.7	28.2	30.4	32.5	34.4	36.2	37.8
9	20.1	23.0	25.7	28.1	30.4	32.5	34.4	36.1	37.7
10	20.1	23.0	25.7	28.2	30.4	32.4	34.2	35.8	37.3
20	20.1	23.1	25.8	28.3	30.7	32.9	35.0	36.9	38.8
30	20.1	23.1	25.8	28.4	30.8	33.1	35.3	37.5	39.5
40	20.1	23.1	25.8	28.4	30.8	33.1	35.4	37.5	39.6

Table 3: Switch points for natural Hermite moment index for various cluster separations and number of terms in the approximation (truncation point).

Trunc.	Cluster Separation								
	4	4.5	5	5.5	6	6.5	7	7.5	8
2	13.2	14.4	15.5	16.5	17.3	18.0	18.6	19.1	19.6
3	13.0	14.3	15.4	16.3	17.1	17.8	18.4	18.9	19.3
4	15.4	17.1	18.5	19.8	20.9	21.9	22.8	23.6	24.3
5	15.4	17.0	18.5	19.7	20.9	21.8	22.7	23.5	24.1
6	17.2	19.2	21.0	22.6	24.1	25.4	26.5	27.6	28.5
7	17.2	19.2	21.0	22.6	24.0	25.3	26.4	27.4	28.4
8	18.6	20.8	22.9	24.8	26.5	28.0	29.4	30.7	31.8
9	18.5	20.8	22.9	24.7	26.4	28.0	29.3	30.6	31.7
10	19.5	21.9	24.2	26.3	28.2	29.9	31.4	32.9	34.1
15	20.5	23.1	25.6	27.8	29.8	31.7	33.3	34.8	36.1
20	20.9	23.6	26.1	28.3	30.3	32.0	33.5	34.9	36.1

Table 4: Switch points for Student's  $t$  orthogonal expansion index given by (7) for various cluster separations and number of terms in the approximation (truncation point).

Trunc.	Cluster Separation								
	4	4.5	5	5.5	6	6.5	7	7.5	8
3	42.2	45.1	47.7	49.9	51.7	53.2	54.4	55.4	56.2
4	42.6	45.5	48.2	50.6	52.6	54.4	55.9	57.3	58.5
5	42.5	45.5	48.2	50.6	52.6	54.4	56.0	57.4	58.6
6	42.6	45.6	48.4	50.8	53.0	54.9	56.6	58.2	59.6
7	42.6	45.7	48.4	50.8	53.0	54.9	56.6	58.2	59.6
8	42.6	45.7	48.4	50.8	53.0	55.0	56.8	58.4	59.9
9	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	59.9
10	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	59.9
11	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	59.9
12	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	60.0
13	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	60.0
14	42.6	45.7	48.4	50.9	53.0	55.0	56.8	58.4	60.0