

5. 特性係数の算出

5.1 特性係数の算出方法

降雨強度式は前節に記したとおり、任意の継続時間 t に対応する確率規模をもった降雨強度 I を 1 つの曲線式であらわしたものである。

表-4 に示した 180 個 (18 観測所 × 確率規模 10 ケース) の降雨強度式の一般式形 $I = a / (t^n + b)$ には、次のような特質がある。

降雨強度式の曲線勾配を左右するものは分母係数 ($t^n + b$) である。
分母係数 ($t^n + b$) が同じでも、分子 (a) が異なればその曲線は異なる。
しかし、それは降雨強度曲線が平行移動するにすぎない。
すなわち、あらゆる降雨強度曲線は曲線の勾配を表わす係数に、ある値を掛けたもので示すことができる。

このことから、あらゆる降雨強度式は、

$$I_N = \quad N \cdot R_N \quad \dots (1)$$

ここに、 I : 降雨強度 (mm/hr)

\quad : 降雨強度曲線の勾配を表わす係数

R : ある基準となる雨量 (mm)

添字 N : それぞれの確率 N 年 である。

で表わすことができるといえる。

曲線の勾配を表わす係数 $\quad N$ は、それぞれの観測所固有のものであり、その地域の降雨の特性によって定まるものであって、これを特性係数 (C_t) とする。

また、降雨強度式により算定した確率規模別の 60 分雨量強度および 120 分雨量強度と、確率日雨量の関係は図-2 に示す通りであり、短時間雨量強度は、日雨量規模に比例して大きくなる傾向にある。

今、式(1)において基準となる雨量 (R) に日雨量 (R_{day}) をあてはめると、式(1)は

$$I = C_t \cdot R_{\text{day}} \quad \dots (2)$$

と置き変えることができる。ここに C_t はその観測所の日雨量に対する特性係数 (式) を示すこととなる。

そのため、これまでに整理した県内の 18 主要観測所の各確率降雨強度式を式(2)の型に変換し、各降雨強度式の特性係数 C_t を求めることとする。

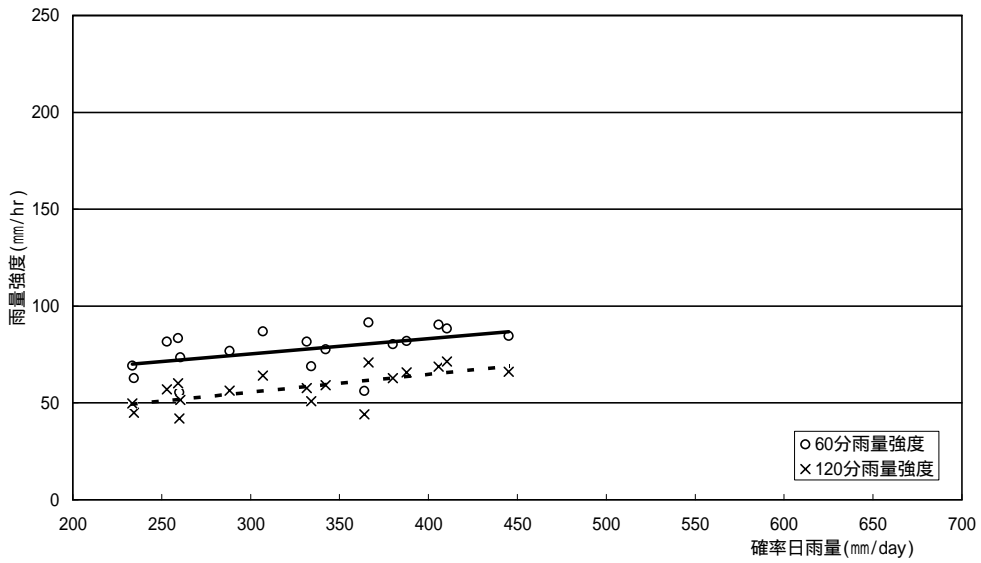


図-2(1) 県内18観測所の日雨量と短時間雨量強度の関係(1/10確率規模)

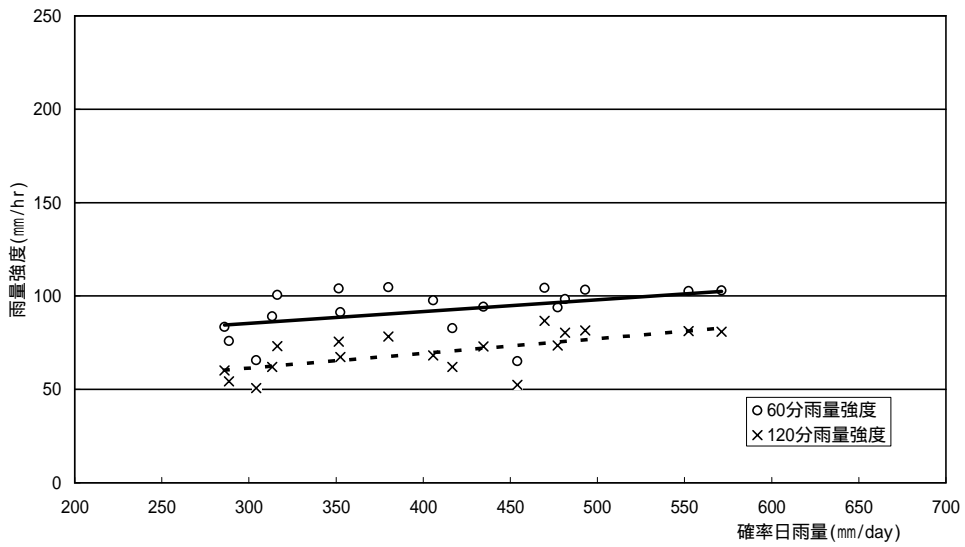


図-2(2) 県内18観測所の日雨量と短時間雨量強度の関係(1/30確率規模)

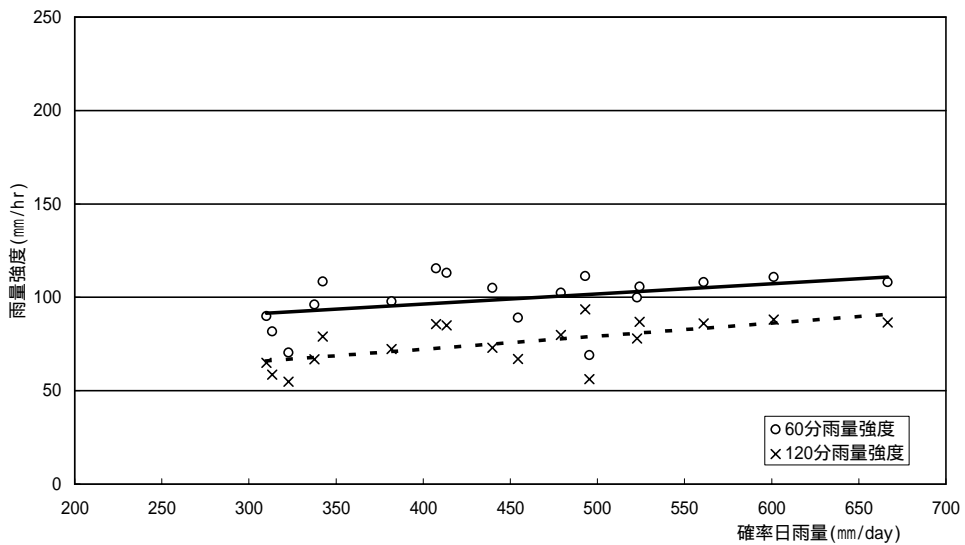


図-2(3) 県内18観測所の日雨量と短時間雨量強度の関係(1/50確率規模)

5.2 観測所の特性係数式 (C_t) の算出

各観測所の確率短時間降雨強度式と、確率日雨量を用いて特性係数式を前述の式(2)により算出する。

具体的には、前節で作成した確率短時間降雨強度式の地方定数 a を確率日雨量 (R_{day}) で除して特性係数式を作成する。

また、降雨強度式の継続時間 t に 10 分、30 分、60 分、120 分、180 分を代入して算出した降雨強度を、日雨量で除することにより、確率規模別、継続時間別の特性係数値 (%) を算出する。

上述の方法により算出した各観測所の確率規模別の特性係数式および特性係数値 (%) について、表-5 に整理した。

表-5 に示した特性係数値を見ると、各観測所により、また降雨の規模によりそれぞれ異なるが、どの観測所においても確率規模が大きくなるに従い、特性係数値は一般に小さくなる傾向がある。同様に、日雨量規模が大きくなるに従い、特性係数値は小さくなる傾向にある。

表-5(1) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值 (%)				
				10分	30分	60分	120分	180分
宿毛	1/2	$\frac{4.43}{t^{0.610} + 3.31}$	144.00	60.0%	39.3%	28.7%	20.3%	16.4%
				60.0%	39.2%	28.8%	20.6%	16.1%
	1/3	$\frac{4.60}{t^{0.618} + 3.93}$	169.70	57.0%	38.0%	27.9%	19.8%	16.0%
				56.9%	37.8%	28.0%	20.2%	15.8%
	1/5	$\frac{5.16}{t^{0.639} + 5.17}$	198.30	54.2%	37.0%	27.4%	19.5%	15.7%
				54.2%	36.9%	27.3%	19.8%	15.6%
	1/10	$\frac{5.34}{t^{0.646} + 5.85}$	234.30	52.0%	36.0%	26.8%	19.2%	15.5%
				52.0%	35.9%	26.8%	19.4%	15.3%
	1/20	$\frac{5.87}{t^{0.663} + 7.07}$	268.80	50.3%	35.3%	26.5%	18.9%	15.3%
				50.2%	35.3%	26.3%	19.2%	15.2%
1/30	$\frac{5.97}{t^{0.666} + 7.42}$	288.60	49.5%	35.0%	26.3%	18.8%	15.2%	
			49.5%	35.0%	26.2%	19.1%	15.1%	
1/50	$\frac{6.27}{t^{0.675} + 8.15}$	313.40	48.6%	34.7%	26.1%	18.7%	15.1%	
			48.6%	34.7%	25.9%	18.9%	15.0%	
1/70	$\frac{6.33}{t^{0.677} + 8.36}$	329.70	48.2%	34.5%	26.0%	18.6%	15.1%	
			48.2%	34.5%	25.8%	18.9%	15.0%	
1/100	$\frac{6.44}{t^{0.680} + 8.7}$	346.90	47.8%	34.2%	25.9%	18.6%	15.0%	
			47.7%	34.3%	25.7%	18.8%	14.9%	
1/200	$\frac{6.68}{t^{0.687} + 9.34}$	380.20	47.1%	33.9%	25.7%	18.5%	14.9%	
			47.0%	34.0%	25.5%	18.7%	14.8%	
足摺	1/2	$\frac{21.86}{t^{0.870} + 25.17}$	143.20	67.1%	49.2%	36.2%	24.4%	18.7%
				67.0%	49.3%	35.9%	24.7%	18.6%
	1/3	$\frac{22.05}{t^{0.874} + 26.79}$	168.90	64.3%	47.6%	35.2%	23.9%	18.3%
				64.3%	47.8%	34.8%	24.1%	18.3%
	1/5	$\frac{19.35}{t^{0.851} + 24.41}$	202.40	61.4%	45.5%	33.9%	23.3%	18.0%
				61.4%	45.8%	33.5%	23.3%	18.0%
	1/10	$\frac{14.96}{t^{0.804} + 19.48}$	253.00	57.9%	42.9%	32.3%	22.5%	17.7%
				57.9%	43.2%	31.9%	22.4%	17.9%
	1/20	$\frac{9.31}{t^{0.717} + 11.66}$	312.10	55.2%	40.3%	30.5%	21.8%	17.5%
				55.2%	40.6%	30.4%	21.4%	17.9%
1/30	$\frac{6.88}{t^{0.662} + 8.24}$	351.60	53.6%	38.8%	29.6%	21.5%	17.5%	
			53.6%	39.0%	29.5%	20.8%	17.9%	
1/50	$\frac{4.34}{t^{0.580} + 4.56}$	407.40	51.9%	36.9%	28.4%	21.0%	17.4%	
			51.8%	37.1%	28.4%	20.2%	18.1%	
1/70	$\frac{3.11}{t^{0.522} + 2.79}$	448.30	50.8%	35.7%	27.6%	20.8%	17.4%	
			50.7%	35.9%	27.7%	19.7%	18.2%	
1/100	$\frac{2.02}{t^{0.450} + 1.23}$	495.70	49.8%	34.5%	26.8%	20.5%	17.4%	
			49.7%	34.6%	27.0%	19.3%	18.3%	
1/200	$\frac{0.81}{t^{0.309} - 0.36}$	601.10	48.0%	32.2%	25.3%	20.0%	17.4%	
			47.7%	32.2%	25.7%	18.4%	18.6%	
佐賀	1/2	$\frac{5.89}{t^{0.638} + 5.66}$	173.10	58.9%	40.9%	30.6%	21.9%	17.8%
				58.9%	40.3%	31.1%	22.2%	17.5%
	1/3	$\frac{4.42}{t^{0.599} + 4.07}$	211.80	55.0%	37.6%	28.2%	20.4%	16.7%
				55.0%	37.2%	28.6%	20.7%	16.4%
	1/5	$\frac{3.81}{t^{0.574} + 3.25}$	242.50	54.5%	37.0%	27.8%	20.2%	16.6%
				54.4%	36.7%	28.0%	20.5%	16.3%
	1/10	$\frac{3.11}{t^{0.544} + 2.41}$	288.40	52.7%	35.5%	26.6%	19.5%	16.2%
				52.6%	35.2%	26.8%	19.8%	15.9%
	1/20	$\frac{2.67}{t^{0.522} + 1.87}$	332.50	51.5%	34.4%	25.8%	19.0%	15.8%
				51.4%	34.2%	26.0%	19.3%	15.6%
1/30	$\frac{2.53}{t^{0.514} + 1.7}$	357.90	50.8%	33.9%	25.5%	18.8%	15.7%	
			50.8%	33.8%	25.6%	19.1%	15.4%	
1/50	$\frac{2.32}{t^{0.502} + 1.45}$	389.60	50.2%	33.4%	25.1%	18.6%	15.5%	
			50.2%	33.3%	25.1%	18.9%	15.3%	
1/70	$\frac{2.24}{t^{0.497} + 1.35}$	410.30	49.9%	33.1%	24.9%	18.5%	15.4%	
			49.9%	33.0%	24.9%	18.7%	15.2%	
1/100	$\frac{2.17}{t^{0.492} + 1.28}$	432.30	49.4%	32.8%	24.7%	18.3%	15.3%	
			49.4%	32.7%	24.7%	18.6%	15.1%	
1/200	$\frac{2.00}{t^{0.481} + 1.07}$	474.90	48.9%	32.3%	24.3%	18.1%	15.2%	
			48.9%	32.3%	24.3%	18.4%	15.0%	

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量

表-5(2) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值 (%)				
				10分	30分	60分	120分	180分
中村	1/2	$\frac{3.99}{t^{0.588} + 3.24}$	172.40	56.0%	37.5%	27.8%	20.0%	16.3%
				56.0%	-	27.7%	20.2%	16.2%
	1/3	$\frac{6.33}{t^{0.669} + 7.16}$	197.50	53.5%	37.4%	27.9%	19.9%	16.0%
				53.5%	-	27.9%	20.1%	16.0%
	1/5	$\frac{9.71}{t^{0.746} + 13.34}$	225.40	51.4%	37.4%	28.1%	19.9%	15.8%
				51.4%	-	28.1%	20.0%	15.7%
	1/10	$\frac{14.69}{t^{0.821} + 23.17}$	260.40	49.3%	37.2%	28.2%	19.8%	15.6%
				49.3%	-	28.2%	19.9%	15.6%
	1/20	$\frac{21.03}{t^{0.887} + 36.32}$	294.00	47.8%	37.1%	28.4%	19.8%	15.4%
				47.8%	-	28.4%	19.8%	15.4%
1/30	$\frac{24.33}{t^{0.914} + 43.43}$	313.30	47.1%	37.0%	28.4%	19.8%	15.3%	
			47.1%	-	28.4%	19.8%	15.3%	
1/50	$\frac{30.03}{t^{0.953} + 55.99}$	337.50	46.2%	36.8%	28.5%	19.8%	15.2%	
			46.2%	-	28.5%	19.8%	15.2%	
1/70	$\frac{33.07}{t^{0.971} + 62.77}$	353.30	45.9%	36.8%	28.5%	19.8%	15.2%	
			45.9%	-	28.5%	19.8%	15.2%	
1/100	$\frac{37.20}{t^{0.993} + 72.11}$	370.10	45.4%	36.7%	28.5%	19.8%	15.1%	
			45.4%	-	28.5%	19.7%	15.2%	
1/200	$\frac{45.85}{t^{1.032} + 92.15}$	402.60	44.6%	36.5%	28.6%	19.8%	15.0%	
			44.6%	-	28.6%	19.7%	15.1%	
江川崎	1/2	$\frac{3.44}{t^{0.596} + 3.8}$	175.60	44.4%	30.2%	22.5%	16.3%	13.3%
				44.4%	30.5%	22.2%	16.1%	13.5%
	1/3	$\frac{2.95}{t^{0.554} + 2.79}$	185.50	46.3%	31.5%	23.7%	17.4%	14.4%
				46.3%	31.6%	23.6%	17.2%	14.5%
	1/5	$\frac{2.33}{t^{0.524} + 2.35}$	228.10	41.0%	28.1%	21.4%	15.9%	13.3%
				41.0%	28.1%	21.5%	15.7%	13.4%
	1/10	$\frac{2.07}{t^{0.496} + 2.07}$	260.00	39.7%	27.6%	21.3%	16.1%	13.6%
				39.7%	27.5%	21.6%	15.9%	13.7%
	1/20	$\frac{1.85}{t^{0.469} + 1.81}$	288.50	38.9%	27.4%	21.4%	16.4%	14.0%
				38.9%	27.1%	21.9%	16.3%	14.0%
1/30	$\frac{1.82}{t^{0.461} + 1.85}$	304.10	38.4%	27.4%	21.6%	16.7%	14.2%	
			38.5%	27.0%	22.1%	16.5%	14.2%	
1/50	$\frac{1.77}{t^{0.449} + 1.83}$	322.70	38.1%	27.5%	21.8%	17.0%	14.6%	
			38.1%	27.0%	22.4%	16.9%	14.5%	
1/70	$\frac{1.70}{t^{0.438} + 1.74}$	334.40	38.0%	27.6%	22.0%	17.2%	14.9%	
			38.0%	27.0%	22.7%	17.2%	14.7%	
1/100	$\frac{1.66}{t^{0.428} + 1.69}$	346.40	37.9%	27.7%	22.2%	17.5%	15.2%	
			37.9%	27.1%	23.0%	17.6%	15.0%	
1/200	$\frac{1.77}{t^{0.427} + 2.03}$	368.60	37.6%	28.0%	22.7%	18.1%	15.8%	
			37.6%	27.3%	23.5%	18.3%	15.5%	
大正	1/2	$\frac{4.10}{t^{0.628} + 4.48}$	196.90	47.0%	31.7%	23.3%	16.6%	13.4%
				46.9%	32.0%	23.1%	16.0%	13.9%
	1/3	$\frac{3.36}{t^{0.595} + 3.65}$	236.00	44.3%	29.9%	22.3%	16.1%	13.1%
				44.2%	30.2%	22.1%	15.6%	13.4%
	1/5	$\frac{2.88}{t^{0.569} + 3.17}$	279.40	41.9%	28.5%	21.4%	15.6%	12.9%
				41.9%	28.7%	21.3%	15.3%	13.1%
	1/10	$\frac{2.41}{t^{0.539} + 2.58}$	334.10	39.9%	27.2%	20.6%	15.3%	12.7%
				39.9%	27.4%	20.6%	15.0%	12.8%
	1/20	$\frac{2.16}{t^{0.521} + 2.29}$	386.50	38.5%	26.4%	20.1%	15.0%	12.5%
				38.5%	26.5%	20.1%	14.8%	12.7%
1/30	$\frac{2.01}{t^{0.509} + 2.08}$	416.70	37.9%	26.0%	19.9%	14.9%	12.5%	
			37.9%	26.1%	19.9%	14.7%	12.6%	
1/50	$\frac{1.86}{t^{0.496} + 1.86}$	454.40	37.2%	25.6%	19.6%	14.7%	12.4%	
			37.2%	25.6%	19.6%	14.6%	12.5%	
1/70	$\frac{1.82}{t^{0.492} + 1.83}$	479.10	36.8%	25.3%	19.5%	14.7%	12.3%	
			36.8%	25.4%	19.5%	14.6%	12.4%	
1/100	$\frac{1.76}{t^{0.487} + 1.76}$	505.20	36.5%	25.1%	19.3%	14.6%	12.3%	
			36.5%	25.1%	19.4%	14.5%	12.4%	
1/200	$\frac{1.63}{t^{0.474} + 1.56}$	555.90	35.9%	24.8%	19.1%	14.5%	12.3%	
			35.8%	24.7%	19.2%	14.4%	12.3%	

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量

表-5(3) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值(%)				
				10分	30分	60分	120分	180分
榑原	1/2	$\frac{2.01}{t^{0.504} + 1.48}$	190.80	43.0%	28.6%	21.5%	15.9%	13.2%
				43.1%	28.8%	21.3%	15.7%	13.4%
	1/3	$\frac{1.25}{t^{0.448} + 0.80}$	256.90	34.6%	23.2%	17.7%	13.4%	11.3%
				34.6%	23.4%	17.4%	13.2%	11.5%
	1/5	$\frac{0.89}{t^{0.383} + 0.15}$	276.90	34.9%	23.4%	18.1%	14.0%	12.0%
				34.9%	23.6%	17.8%	13.7%	12.3%
	1/10	$\frac{0.57}{t^{0.320} - 0.29}$	333.90	31.9%	21.4%	16.8%	13.2%	11.5%
				31.8%	21.6%	16.6%	12.9%	11.8%
	1/20	$\frac{0.41}{t^{0.274} - 0.51}$	388.60	29.8%	20.1%	15.9%	12.7%	11.2%
				29.6%	20.3%	15.7%	12.4%	11.5%
1/30	$\frac{0.31}{t^{0.241} - 0.65}$	420.00	28.8%	19.4%	15.5%	12.5%	11.1%	
			28.7%	19.6%	15.3%	12.2%	11.4%	
1/50	$\frac{0.25}{t^{0.214} - 0.73}$	459.30	27.7%	18.8%	15.0%	12.2%	10.9%	
			27.7%	19.0%	14.8%	11.9%	11.2%	
1/70	$\frac{0.21}{t^{0.195} - 0.78}$	485.10	27.1%	18.3%	14.8%	12.1%	10.8%	
			27.1%	18.6%	14.6%	11.8%	11.1%	
1/100	$\frac{0.18}{t^{0.179} - 0.82}$	512.40	26.6%	18.0%	14.5%	11.9%	10.7%	
			26.6%	18.3%	14.3%	11.6%	11.1%	
1/200	$\frac{0.13}{t^{0.143} - 0.89}$	565.20	25.6%	17.4%	14.1%	11.7%	10.6%	
			25.7%	17.7%	14.0%	11.4%	10.9%	
船戸	1/2	$\frac{3.80}{t^{0.603} + 6.78}$	267.40	35.2%	26.1%	20.5%	15.4%	12.8%
				35.2%	26.3%	20.3%	15.4%	12.9%
	1/3	$\frac{3.62}{t^{0.590} + 7.01}$	318.10	33.2%	25.1%	19.9%	15.2%	12.7%
				33.2%	25.1%	19.8%	15.1%	12.8%
	1/5	$\frac{3.28}{t^{0.569} + 6.64}$	374.40	31.7%	24.2%	19.4%	15.0%	12.7%
				31.7%	24.3%	19.4%	14.9%	12.8%
	1/10	$\frac{3.16}{t^{0.558} + 6.81}$	445.20	30.3%	23.5%	19.0%	14.9%	12.7%
				30.3%	23.5%	19.0%	14.8%	12.7%
	1/20	$\frac{3.13}{t^{0.553} + 7.1}$	513.20	29.3%	22.9%	18.7%	14.8%	12.6%
				29.3%	22.9%	18.8%	14.6%	12.7%
1/30	$\frac{3.04}{t^{0.546} + 7}$	552.30	28.9%	22.7%	18.6%	14.7%	12.6%	
			28.9%	22.6%	18.7%	14.6%	12.7%	
1/50	$\frac{2.98}{t^{0.541} + 7}$	601.10	28.4%	22.4%	18.4%	14.7%	12.6%	
			28.4%	22.4%	18.5%	14.5%	12.7%	
1/70	$\frac{3.00}{t^{0.541} + 7.19}$	633.10	28.1%	22.3%	18.4%	14.6%	12.6%	
			28.1%	22.2%	18.5%	14.5%	12.7%	
1/100	$\frac{3.02}{t^{0.541} + 7.36}$	667.00	27.9%	22.1%	18.3%	14.6%	12.6%	
			27.9%	22.1%	18.4%	14.5%	12.7%	
1/200	$\frac{3.02}{t^{0.539} + 7.55}$	732.70	27.4%	21.9%	18.2%	14.6%	12.6%	
			27.4%	21.8%	18.3%	14.4%	12.7%	
佐川	1/2	$\frac{8.20}{t^{0.711} + 12.59}$	203.70	46.2%	34.4%	26.5%	19.2%	15.6%
				46.2%	34.6%	26.3%	19.3%	15.6%
	1/3	$\frac{6.75}{t^{0.677} + 11.02}$	241.30	42.8%	32.1%	25.0%	18.4%	15.1%
				42.8%	32.2%	24.9%	18.5%	15.1%
	1/5	$\frac{5.83}{t^{0.651} + 10.18}$	284.90	39.8%	30.2%	23.8%	17.8%	14.7%
				39.8%	30.2%	23.8%	17.8%	14.8%
	1/10	$\frac{5.58}{t^{0.641} + 10.79}$	342.20	36.8%	28.4%	22.7%	17.3%	14.4%
				36.8%	28.4%	22.8%	17.2%	14.5%
	1/20	$\frac{5.89}{t^{0.647} + 12.65}$	400.00	34.5%	27.2%	22.0%	16.9%	14.2%
				34.5%	27.1%	22.2%	16.7%	14.3%
1/30	$\frac{6.24}{t^{0.655} + 14.17}$	434.50	33.4%	26.6%	21.7%	16.8%	14.1%	
			33.4%	26.5%	21.9%	16.5%	14.3%	
1/50	$\frac{7.03}{t^{0.673} + 17.15}$	479.00	32.2%	26.0%	21.4%	16.7%	14.0%	
			32.2%	25.9%	21.7%	16.3%	14.2%	
1/70	$\frac{7.58}{t^{0.684} + 19.25}$	509.00	31.5%	25.7%	21.2%	16.6%	14.0%	
			31.5%	25.5%	21.6%	16.2%	14.2%	
1/100	$\frac{8.80}{t^{0.708} + 23.57}$	541.50	30.7%	25.4%	21.1%	16.5%	14.0%	
			30.7%	25.2%	21.5%	16.0%	14.2%	
1/200	$\frac{12.24}{t^{0.762} + 35.88}$	606.70	29.4%	24.9%	20.9%	16.5%	13.9%	
			29.4%	24.6%	21.4%	15.8%	14.2%	

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量

表-5(4) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值 (%)				
				10分	30分	60分	120分	180分
池川	1/2	$\frac{3.08}{t^{0.537} + 4.03}$	231.80	41.2%	30.0%	23.6%	18.0%	15.2%
				41.2%	30.1%	23.5%	18.0%	15.2%
	1/3	$\frac{2.64}{t^{0.506} + 3.73}$	276.20	38.0%	28.3%	22.6%	17.6%	15.0%
				38.0%	28.4%	22.4%	17.7%	15.0%
	1/5	$\frac{2.39}{t^{0.484} + 3.71}$	325.60	35.4%	26.9%	21.8%	17.3%	14.9%
				35.4%	27.0%	21.7%	17.4%	14.8%
	1/10	$\frac{2.24}{t^{0.467} + 3.82}$	387.70	33.1%	25.7%	21.1%	17.0%	14.8%
				33.1%	25.7%	21.0%	17.2%	14.7%
	1/20	$\frac{2.13}{t^{0.454} + 3.91}$	447.20	31.5%	24.8%	20.6%	16.8%	14.7%
				31.5%	24.9%	20.5%	17.0%	14.6%
1/30	$\frac{2.14}{t^{0.452} + 4.12}$	481.50	30.8%	24.4%	20.4%	16.7%	14.7%	
			30.8%	24.5%	20.2%	16.9%	14.6%	
1/50	$\frac{2.10}{t^{0.446} + 4.22}$	524.30	30.0%	24.0%	20.2%	16.6%	14.6%	
			30.0%	24.0%	20.0%	16.8%	14.6%	
1/70	$\frac{2.10}{t^{0.444} + 4.32}$	552.40	29.6%	23.7%	20.0%	16.5%	14.6%	
			29.5%	23.8%	19.9%	16.8%	14.5%	
1/100	$\frac{2.18}{t^{0.448} + 4.7}$	582.10	29.1%	23.5%	19.9%	16.5%	14.6%	
			29.1%	23.6%	19.7%	16.7%	14.5%	
1/200	$\frac{2.10}{t^{0.439} + 4.65}$	639.60	28.4%	23.1%	19.7%	16.4%	14.6%	
			28.4%	23.2%	19.5%	16.6%	14.5%	
本山	1/2	$\frac{3.20}{t^{0.532} + 4.21}$	225.90	42.0%	31.0%	24.5%	18.8%	15.9%
				42.0%	30.8%	24.5%	19.3%	15.7%
	1/3	$\frac{3.59}{t^{0.552} + 5.78}$	268.70	38.4%	29.2%	23.4%	18.1%	15.4%
				38.4%	29.0%	23.3%	18.6%	15.1%
	1/5	$\frac{4.28}{t^{0.584} + 8.28}$	317.40	35.4%	27.5%	22.3%	17.4%	14.8%
				35.3%	27.5%	22.1%	17.8%	14.5%
	1/10	$\frac{5.00}{t^{0.615} + 11.22}$	380.00	32.6%	25.9%	21.1%	16.5%	14.0%
				32.5%	25.9%	20.9%	17.0%	13.8%
	1/20	$\frac{5.77}{t^{0.646} + 14.51}$	441.40	30.5%	24.6%	20.2%	15.8%	13.4%
				30.4%	24.7%	19.9%	16.2%	13.2%
1/30	$\frac{6.16}{t^{0.661} + 16.32}$	477.20	29.5%	23.9%	19.7%	15.4%	13.0%	
			29.4%	24.1%	19.3%	15.7%	12.9%	
1/50	$\frac{6.93}{t^{0.687} + 19.63}$	522.70	28.3%	23.1%	19.1%	14.9%	12.6%	
			28.2%	23.4%	18.7%	15.2%	12.5%	
1/70	$\frac{6.86}{t^{0.689} + 19.83}$	552.70	27.8%	22.7%	18.7%	14.6%	12.3%	
			27.7%	22.9%	18.3%	14.9%	12.3%	
1/100	$\frac{7.43}{t^{0.707} + 22.35}$	584.80	27.1%	22.2%	18.4%	14.3%	12.0%	
			27.0%	22.5%	17.9%	14.5%	12.0%	
1/200	$\frac{8.08}{t^{0.730} + 25.79}$	647.70	25.9%	21.4%	17.7%	13.8%	11.5%	
			25.8%	21.8%	17.2%	13.9%	11.6%	
繁藤	1/2	$\frac{8.98}{t^{0.709} + 12.86}$	229.40	49.9%	37.4%	28.9%	21.0%	17.1%
				50.0%	36.8%	29.5%	21.2%	16.9%
	1/3	$\frac{7.74}{t^{0.688} + 11.62}$	269.70	46.9%	35.2%	27.3%	20.1%	16.4%
				46.9%	34.6%	27.9%	20.2%	16.2%
	1/5	$\frac{6.13}{t^{0.654} + 9.79}$	323.20	42.9%	32.2%	25.2%	18.7%	15.5%
				42.9%	31.6%	25.8%	18.9%	15.2%
	1/10	$\frac{4.37}{t^{0.605} + 7.72}$	405.80	37.2%	28.1%	22.3%	16.9%	14.2%
				37.3%	27.6%	22.9%	17.0%	14.0%
	1/20	$\frac{3.18}{t^{0.560} + 6.34}$	504.50	31.9%	24.3%	19.6%	15.2%	12.9%
				31.9%	23.8%	20.1%	15.2%	12.7%
1/30	$\frac{2.40}{t^{0.519} + 4.96}$	571.30	29.1%	22.2%	18.0%	14.2%	12.2%	
			29.1%	21.8%	18.5%	14.2%	12.0%	
1/50	$\frac{1.67}{t^{0.466} + 3.53}$	666.60	25.8%	19.8%	16.2%	13.0%	11.3%	
			25.8%	19.4%	16.7%	13.0%	11.2%	
1/70	$\frac{1.34}{t^{0.435} + 2.91}$	737.10	23.7%	18.3%	15.1%	12.2%	10.7%	
			23.8%	18.0%	15.5%	12.2%	10.6%	
1/100	$\frac{0.98}{t^{0.392} + 2.05}$	819.20	21.8%	16.9%	14.0%	11.5%	10.1%	
			21.8%	16.5%	14.4%	11.5%	10.1%	
1/200	$\frac{0.52}{t^{0.305} + 0.79}$	1002.80	18.4%	14.3%	12.1%	10.1%	9.1%	
			18.4%	14.0%	12.4%	10.1%	9.1%	

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量

表-5(5) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值 (%)				
				10分	30分	60分	120分	180分
大 栃	1/2	$\frac{5.32}{t^{0.636} + 6.52}$	207.90	49.1%	35.0%	26.6%	19.3%	15.8%
				49.1%	34.9%	26.6%	19.4%	15.7%
	1/3	$\frac{7.53}{t^{0.706} + 11.14}$	243.10	46.4%	33.9%	25.8%	18.6%	15.0%
				46.4%	33.9%	25.9%	18.6%	15.0%
	1/5	$\frac{9.88}{t^{0.763} + 16.45}$	282.30	44.4%	33.1%	25.2%	18.0%	14.3%
				44.4%	33.1%	25.3%	17.9%	14.3%
	1/10	$\frac{12.82}{t^{0.818} + 23.56}$	331.50	42.5%	32.3%	24.6%	17.4%	13.7%
				42.5%	32.3%	24.7%	17.3%	13.8%
	1/20	$\frac{16.51}{t^{0.870} + 32.81}$	378.60	41.0%	31.7%	24.3%	17.0%	13.3%
				41.0%	31.7%	24.3%	16.8%	13.4%
1/30	$\frac{17.99}{t^{0.889} + 36.67}$	405.80	40.5%	31.4%	24.1%	16.8%	13.1%	
			40.5%	31.5%	24.1%	16.6%	13.2%	
1/50	$\frac{21.06}{t^{0.921} + 44.69}$	439.70	39.7%	31.1%	23.9%	16.6%	12.8%	
			39.7%	31.2%	23.9%	16.4%	13.0%	
1/70	$\frac{22.47}{t^{0.935} + 48.48}$	462.00	39.4%	31.0%	23.8%	16.5%	12.7%	
			39.4%	31.1%	23.8%	16.3%	12.8%	
1/100	$\frac{24.01}{t^{0.949} + 52.77}$	485.50	38.9%	30.8%	23.7%	16.4%	12.6%	
			38.9%	30.9%	23.6%	16.1%	12.7%	
1/200	$\frac{27.17}{t^{0.975} + 61.45}$	531.10	38.3%	30.5%	23.5%	16.2%	12.4%	
			38.3%	30.7%	23.5%	15.9%	12.5%	
田 野	1/2	$\frac{7.37}{t^{0.678} + 7.36}$	146.20	60.8%	42.4%	31.5%	22.3%	17.9%
				60.7%	42.7%	30.9%	22.7%	17.8%
	1/3	$\frac{8.36}{t^{0.700} + 9.61}$	171.10	57.2%	40.9%	30.8%	21.9%	17.6%
				57.2%	41.1%	30.4%	22.2%	17.5%
	1/5	$\frac{9.93}{t^{0.730} + 13}$	198.70	54.1%	39.8%	30.2%	21.6%	17.3%
				54.1%	40.0%	29.9%	21.8%	17.3%
	1/10	$\frac{11.40}{t^{0.754} + 16.51}$	233.50	51.4%	38.7%	29.7%	21.3%	17.1%
				51.4%	38.8%	29.5%	21.4%	17.1%
	1/20	$\frac{13.23}{t^{0.780} + 20.7}$	266.80	49.5%	37.9%	29.3%	21.1%	16.9%
				49.5%	38.0%	29.2%	21.1%	17.0%
1/30	$\frac{14.80}{t^{0.800} + 24.21}$	286.00	48.5%	37.5%	29.2%	21.1%	16.8%	
			48.5%	37.7%	29.1%	21.0%	16.9%	
1/50	$\frac{15.84}{t^{0.812} + 26.77}$	310.00	47.6%	37.2%	29.0%	21.0%	16.7%	
			47.6%	37.3%	29.0%	20.8%	16.8%	
1/70	$\frac{16.77}{t^{0.822} + 29.05}$	325.70	47.0%	36.9%	28.9%	20.9%	16.7%	
			47.0%	37.0%	28.9%	20.7%	16.8%	
1/100	$\frac{17.75}{t^{0.832} + 31.41}$	342.30	46.5%	36.7%	28.8%	20.9%	16.6%	
			46.5%	36.8%	28.8%	20.7%	16.8%	
1/200	$\frac{19.65}{t^{0.850} + 36.1}$	374.50	45.5%	36.3%	28.7%	20.8%	16.6%	
			45.5%	36.4%	28.7%	20.5%	16.7%	
室 戸 岬	1/2	$\frac{11.92}{t^{0.754} + 13.64}$	164.30	61.7%	44.8%	33.5%	23.6%	18.7%
				61.7%	44.7%	33.6%	23.6%	18.6%
	1/3	$\frac{11.80}{t^{0.749} + 14.30}$	191.30	59.3%	43.6%	33.0%	23.4%	18.7%
				59.3%	43.7%	32.9%	23.4%	18.7%
	1/5	$\frac{12.45}{t^{0.756} + 16.06}$	221.40	57.2%	42.7%	32.6%	23.3%	18.7%
				57.2%	43.0%	32.3%	23.2%	18.8%
	1/10	$\frac{12.15}{t^{0.749} + 16.23}$	259.20	55.6%	41.9%	32.2%	23.2%	18.7%
				55.6%	42.3%	31.8%	23.1%	18.8%
	1/20	$\frac{12.36}{t^{0.750} + 17.15}$	295.50	54.3%	41.2%	31.9%	23.1%	18.6%
				54.2%	41.8%	31.4%	23.0%	18.9%
1/30	$\frac{12.58}{t^{0.752} + 17.84}$	316.30	53.6%	40.9%	31.8%	23.1%	18.6%	
			53.5%	41.5%	31.2%	22.9%	18.9%	
1/50	$\frac{12.58}{t^{0.751} + 18.1}$	342.40	53.0%	40.6%	31.7%	23.1%	18.6%	
			52.9%	41.2%	31.0%	22.9%	18.9%	
1/70	$\frac{13.00}{t^{0.756} + 19.04}$	359.50	52.5%	40.5%	31.6%	23.1%	18.6%	
			52.4%	41.1%	30.9%	22.8%	18.9%	
1/100	$\frac{12.83}{t^{0.753} + 18.89}$	377.50	52.2%	40.3%	31.5%	23.0%	18.6%	
			52.1%	41.0%	30.8%	22.8%	19.0%	
1/200	$\frac{13.12}{t^{0.756} + 19.72}$	412.60	51.6%	40.0%	31.4%	23.0%	18.6%	
			51.5%	40.7%	30.7%	22.7%	19.0%	

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量

表-5(6) 県内18観測所短時間確率特性係数式一覧

	確率規模	特性係数式 C_t	日雨量 (mm)	確率規模別特性係数值(%)				
				10分	30分	60分	120分	180分
佐喜浜	1/2	$\frac{6.47}{t^{0.629} + 7.88}$	213.70	53.3%	39.5%	30.8%	23.0%	19.0%
				53.3%	39.2%	31.0%	23.4%	18.7%
	1/3	$\frac{5.57}{t^{0.603} + 7.08}$	250.70	50.2%	37.5%	29.5%	22.3%	18.6%
				50.3%	37.0%	29.8%	22.8%	18.2%
	1/5	$\frac{4.25}{t^{0.562} + 5.4}$	297.70	47.0%	34.9%	27.6%	21.1%	17.8%
				47.0%	34.3%	28.0%	21.7%	17.3%
	1/10	$\frac{2.73}{t^{0.499} + 3.2}$	366.30	42.9%	31.5%	25.0%	19.3%	16.5%
				42.9%	30.8%	25.5%	20.0%	16.0%
	1/20	$\frac{1.57}{t^{0.424} + 1.33}$	443.30	39.4%	28.2%	22.4%	17.6%	15.1%
				39.4%	27.6%	23.0%	18.2%	14.6%
上魚梁瀬	1/2	$\frac{2.30}{t^{0.505} + 2.81}$	283.00	38.3%	27.5%	21.5%	16.4%	13.9%
				38.4%	27.2%	21.7%	16.8%	13.6%
	1/3	$\frac{1.70}{t^{0.448} + 1.72}$	323.20	37.5%	26.9%	21.3%	16.5%	14.2%
				37.5%	26.5%	21.5%	17.0%	13.9%
	1/5	$\frac{1.25}{t^{0.391} + 0.9}$	364.30	37.1%	26.6%	21.3%	16.8%	14.6%
				37.1%	26.2%	21.5%	17.3%	14.3%
	1/10	$\frac{0.81}{t^{0.316} + 0.1}$	410.40	37.2%	26.6%	21.5%	17.4%	15.3%
				37.1%	26.3%	21.7%	17.8%	15.0%
	1/20	$\frac{0.49}{t^{0.240} - 0.43}$	449.40	37.6%	26.8%	21.9%	18.0%	16.1%
				37.7%	26.7%	22.1%	18.3%	15.9%
高知	1/2	$\frac{9.32}{t^{0.723} + 10.91}$	185.60	57.5%	41.2%	30.8%	21.8%	17.4%
				57.5%	41.2%	30.9%	21.9%	17.3%
	1/3	$\frac{9.49}{t^{0.722} + 12.59}$	220.10	53.1%	39.1%	29.8%	21.4%	17.2%
				53.2%	38.9%	30.1%	21.5%	17.1%
	1/5	$\frac{10.13}{t^{0.729} + 15.16}$	258.60	49.4%	37.4%	29.0%	21.1%	17.1%
				49.4%	37.0%	29.5%	21.2%	17.0%
	1/10	$\frac{12.13}{t^{0.756} + 20.73}$	307.00	45.9%	35.9%	28.3%	20.9%	17.0%
				45.9%	35.3%	28.9%	20.9%	16.9%
	1/20	$\frac{13.57}{t^{0.772} + 25.23}$	353.40	43.6%	34.7%	27.8%	20.7%	16.9%
				43.6%	34.1%	28.5%	20.7%	16.8%
	1/30	$\frac{14.49}{t^{0.782} + 28.03}$	380.10	42.5%	34.2%	27.6%	20.6%	16.8%
				42.6%	33.5%	28.3%	20.6%	16.8%
	1/50	$\frac{16.97}{t^{0.808} + 34.7}$	413.40	41.3%	33.7%	27.3%	20.6%	16.8%
				41.4%	32.9%	28.1%	20.5%	16.7%
	1/70	$\frac{17.57}{t^{0.813} + 36.68}$	435.30	40.7%	33.4%	27.2%	20.5%	16.8%
				40.8%	32.6%	28.0%	20.4%	16.7%
	1/100	$\frac{18.71}{t^{0.823} + 40.05}$	458.40	40.1%	33.1%	27.1%	20.5%	16.7%
				40.2%	32.3%	27.9%	20.4%	16.7%
	1/200	$\frac{21.76}{t^{0.848} + 48.8}$	503.30	39.0%	32.6%	26.9%	20.4%	16.7%
				39.1%	31.8%	27.7%	20.3%	16.6%

上段：特性係数式より算出した値
下段：確率計算結果(真値)/確率日雨量