《石油地震检波器校准规范》试验报告

1. 试验日期和地点：
2. 试验日期：2022年6月--9月
3. 试验地点：石油物探计量中心物探专用校准室
4. 试验目的：

通过试验在理论上，了解检波器测量参数的量值溯源与传递关系，在实践上，掌握多种型号不同参数的校准，以及在测试仪测试、振动台测试试验校准的操作要领、基本步骤和方法。

三、试验设备及环境要求：

1. 试验设备：检波器测试仪、振动台
2. 环境要求： 环境温度：20℃±2℃。

相对湿度：≤80％RH。

四、试验内容：

1. 将检波器在室温环境下静止存放4小时后，把样品稳定垂直地放在隔震台上，用经过标定合格的检波器测试仪进行测试，直接得到被校准检波器的电阻、频率、阻尼、灵敏度、失真度的测量误差。
2. 将检波器在室温环境下静止存放4小时后，样品稳定地放在隔震台的倾角底座上，用检波器测试仪分别在15度、20度、25度倾角下测试，直接得到被校准检波器的电阻、频率、阻尼、灵敏度、失真度的测量误差，判断其值是否超过产品标定的范围。
3. 使用垂直振动台校准系统，将检波器刚性固定在垂直振动台的台面上，振动台以5Hz-300Hz的频率输出，测试检波器在规定频率范围内的震动响应特性，由响应是结果绘制幅频曲线、相频曲线。
4. 使用垂直振动台校准系统，将检波器刚性固定在垂直振动台的台面上，振动台以31.5Hz的频率震动，输出能量由0变大，测试检波器在规定频率的震动响应特性，由响应是结果绘制线性度曲线。
5. 使用横向振动台校准系统，将检波器刚性固定在横向振动台的台面上，振动台以5Hz-300Hz的频率输出，测试检波器在规定频率范围内的震动响应特性，由响应是结果得到假频值。

五、试验记录数据：

1. 检波器采用检波器测试仪校准

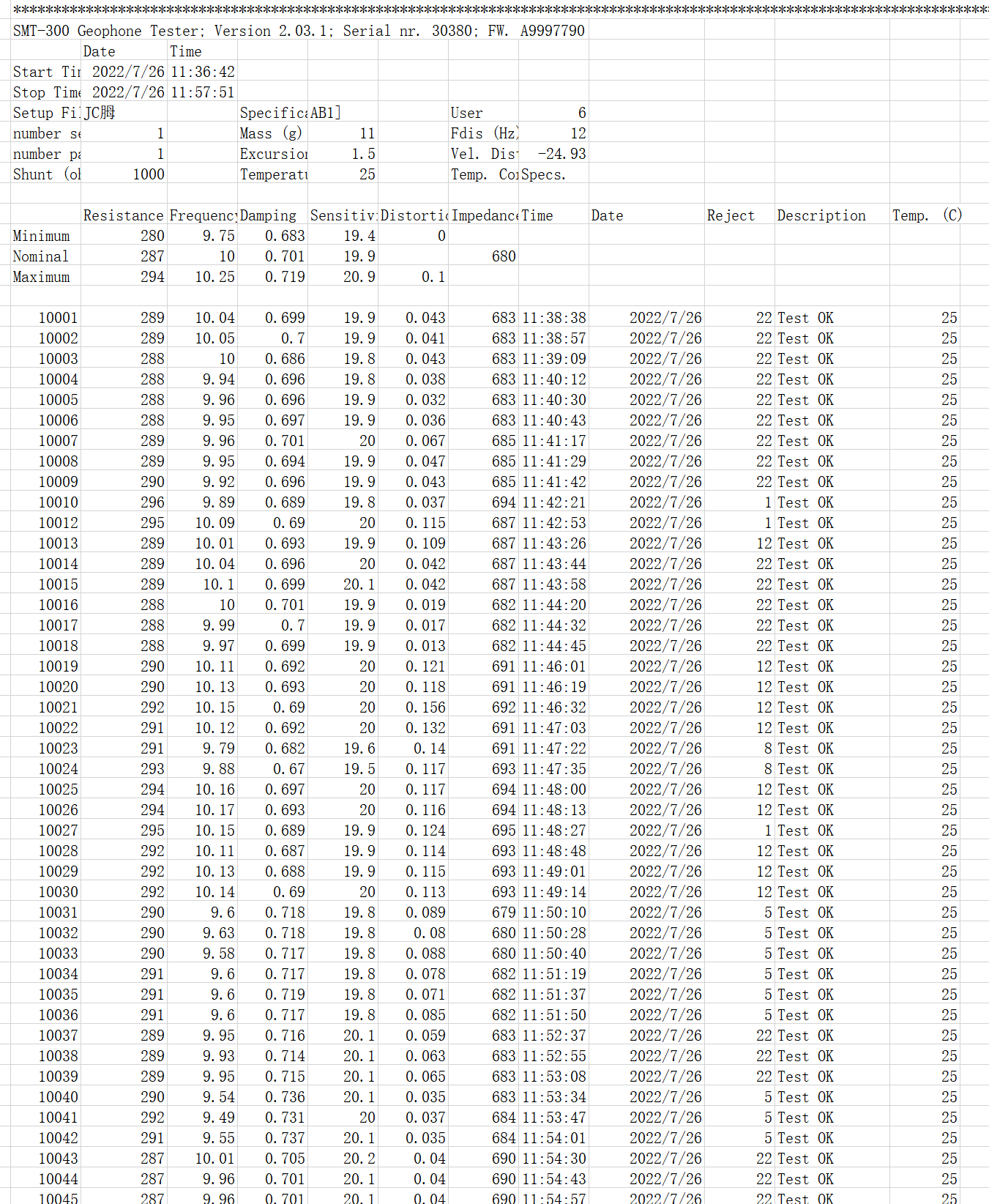
检波器校准记录表

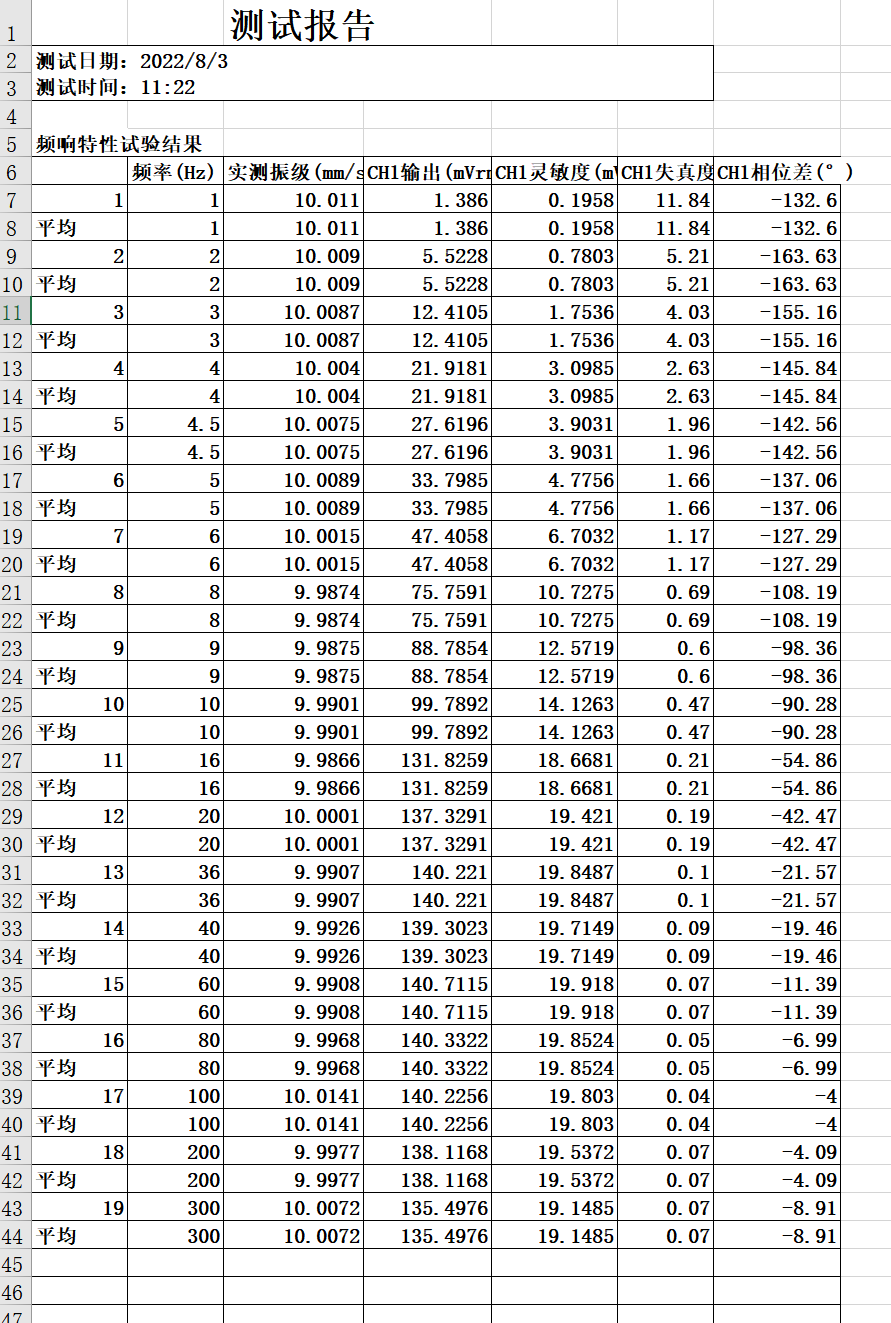
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 规格型号 | | 见“检波器规格型号表” | | | | | | 个 数 | | | | 250 | | | |
| 计量标准器名称 | | | | 计量标准器证书编号 | | | | | | | 有效期 | | | | |
| 检波器测试仪SMT-300 | | | | ZJ-W-2022-00262 | | | | | | | 2022年3月22日 至 2023年3月21日 | | | | |
| 环境条件： | | | | 温度：20.5℃ 相对湿度： 36% | | | | | | | | | | | |
| 序号 | 检波器  编号 | | 测试记录 | | | 备注 | | 序号 | | 检波器  编号 | | | 测试记录 | | 备注 |
| 1 | A01 | | 10001 | ~10003 | |  | | 36 | | A36 | | | 10106 | ~10108 |  |
| 2 | A02 | | 10004 | ~10006 | |  | | 37 | | A37 | | | 10109 | ~10111 |  |
| 3 | A03 | | 10007 | ~10009 | |  | | 38 | | A38 | | | 10112 | ~10114 |  |
| 4 | A04 | | 10010 | ~10012 | |  | | 39 | | A39 | | | 10115 | ~10117 |  |
| 5 | A05 | | 10013 | ~10015 | |  | | 40 | | A40 | | | 10118 | ~10120 |  |
| 6 | A06 | | 10016 | ~10018 | |  | | 41 | | A41 | | | 10121 | ~10123 |  |
| 7 | A07 | | 10019 | ~10021 | |  | | 42 | | A42 | | | 10124 | ~10126 |  |
| 8 | A08 | | 10022 | ~10024 | |  | | 43 | | A43 | | | 10127 | ~10129 |  |
| 9 | A09 | | 10025 | ~10027 | |  | | 44 | | A44 | | | 10130 | ~10132 |  |
| 10 | A10 | | 10028 | ~10030 | |  | | 45 | | A45 | | | 10133 | ~10135 |  |
| 11 | A11 | | 10031 | ~10033 | |  | | 46 | | A46 | | | 10136 | ~10138 |  |
| 12 | A12 | | 10034 | ~10036 | |  | | 47 | | A47 | | | 10139 | ~10141 |  |
| 13 | A13 | | 10037 | ~10039 | |  | | 48 | | A48 | | | 10142 | ~10144 |  |
| 14 | A14 | | 10040 | ~10042 | |  | | 49 | | A49 | | | 10145 | ~10147 |  |
| 15 | A15 | | 10043 | ~10045 | |  | | 50 | | A50 | | | 10148 | ~10150 |  |
| 16 | A16 | | 10046 | ~10048 | |  | | 51 | | A51 | | | 10151 | ~10153 |  |
| 17 | A17 | | 10049 | ~10051 | |  | | 52 | | A52 | | | 10154 | ~10156 |  |
| 18 | A18 | | 10052 | ~10054 | |  | | 53 | | A53 | | | 10157 | ~10159 |  |
| 19 | A19 | | 10055 | ~10057 | |  | | 54 | | A54 | | | 10160 | ~10162 |  |
| 20 | A20 | | 10058 | ~10060 | |  | | 55 | | A55 | | | 10163 | ~10165 |  |
| 21 | A21 | | 10061 | ~10063 | |  | | 56 | | A56 | | | 10166 | ~10168 |  |
| 22 | A22 | | 10064 | ~10066 | |  | | 57 | | A57 | | | 10169 | ~10171 |  |
| 23 | A23 | | 10067 | ~10069 | |  | | 58 | | A58 | | | 10172 | ~10174 |  |
| 24 | A24 | | 10070 | ~10072 | |  | | 59 | | A59 | | | 10175 | ~10177 |  |
| 25 | A25 | | 10073 | ~10075 | |  | | 60 | | A60 | | | 10178 | ~10180 |  |
| 26 | A26 | | 10076 | ~10078 | |  | | 61 | | A61 | | | 10181 | ~10183 |  |
| 27 | A27 | | 10079 | ~10081 | |  | | 62 | | A62 | | | 10184 | ~10186 |  |
| 28 | A28 | | 10082 | ~10084 | |  | | 63 | | A63 | | | 10187 | ~10189 |  |
| 29 | A29 | | 10085 | ~10087 | |  | | 64 | | A64 | | | 10190 | ~10192 |  |
| 30 | A30 | | 10088 | ~10090 | |  | | 65 | | A65 | | | 10193 | ~10195 |  |
| 31 | A31 | | 10091 | ~10093 | |  | | 66 | | A66 | | | 10196 | ~10198 |  |
| 32 | A32 | | 10094 | ~10096 | |  | | 67 | | A67 | | | 10199 | ~10201 |  |
| 33 | A33 | | 10097 | ~10099 | |  | | 68 | | A68 | | | 10202 | ~10204 |  |
| 34 | A34 | | 10100 | ~10102 | |  | | 69 | | A69 | | | 10205 | ~10207 |  |
| 35 | A35 | | 10103 | ~10105 | |  | | 70 | | A70 | | | 10208 | ~10210 |  |
| 序号 | 检波器编号 | | 测试记录 | | | 备注 | | 序号 | | 检波器 | | | 测试记录 | | 备注 |
| 编号 | | |
| 71 | B01 | | 10211 | ~10213 | |  | | 106 | | B36 | | | 10316 | ~10318 |  |
| 72 | B02 | | 10214 | ~10216 | |  | | 107 | | B37 | | | 10319 | ~10321 |  |
| 73 | B03 | | 10217 | ~10219 | |  | | 108 | | B38 | | | 10322 | ~10324 |  |
| 74 | B04 | | 10220 | ~10222 | |  | | 109 | | B39 | | | 10325 | ~10327 |  |
| 75 | B05 | | 10223 | ~10225 | |  | | 110 | | B40 | | | 10328 | ~10330 |  |
| 76 | B06 | | 10226 | ~10228 | |  | | 111 | | B41 | | | 10331 | ~10333 |  |
| 77 | B07 | | 10229 | ~10231 | |  | | 112 | | B42 | | | 10334 | ~10336 |  |
| 78 | B08 | | 10232 | ~10234 | |  | | 113 | | B43 | | | 10337 | ~10339 |  |
| 79 | B09 | | 10235 | ~10237 | |  | | 114 | | B44 | | | 10340 | ~10342 |  |
| 80 | B10 | | 10238 | ~10240 | |  | | 115 | | B45 | | | 10343 | ~10345 |  |
| 81 | B11 | | 10241 | ~10243 | |  | | 116 | | B46 | | | 10346 | ~10348 |  |
| 82 | B12 | | 10244 | ~10246 | |  | | 117 | | B47 | | | 10349 | ~10351 |  |
| 83 | B13 | | 10247 | ~10249 | |  | | 118 | | B48 | | | 10352 | ~10354 |  |
| 84 | B14 | | 10250 | ~10252 | |  | | 119 | | B49 | | | 10355 | ~10357 |  |
| 85 | B15 | | 10253 | ~10255 | |  | | 120 | | B50 | | | 10358 | ~10360 |  |
| 86 | B16 | | 10256 | ~10258 | |  | | 121 | | B51 | | | 10361 | ~10363 |  |
| 87 | B17 | | 10259 | ~10261 | |  | | 122 | | B52 | | | 10364 | ~10366 |  |
| 88 | B18 | | 10262 | ~10264 | |  | | 123 | | B53 | | | 10367 | ~10369 |  |
| 89 | B19 | | 10265 | ~10267 | |  | | 124 | | B54 | | | 10370 | ~10372 |  |
| 90 | B20 | | 10268 | ~10270 | |  | | 125 | | B55 | | | 10373 | ~10375 |  |
| 91 | B21 | | 10271 | ~10273 | |  | | 126 | | B56 | | | 10376 | ~10378 |  |
| 92 | B22 | | 10274 | ~10276 | |  | | 127 | | B57 | | | 10379 | ~10381 |  |
| 93 | B23 | | 10277 | ~10279 | |  | | 128 | | B58 | | | 10382 | ~10384 |  |
| 94 | B24 | | 10280 | ~10282 | |  | | 129 | | B59 | | | 10385 | ~10387 |  |
| 95 | B25 | | 10283 | ~10285 | |  | | 130 | | B60 | | | 10388 | ~10390 |  |
| 96 | B26 | | 10286 | ~10288 | |  | | 131 | | B61 | | | 10391 | ~10393 |  |
| 97 | B27 | | 10289 | ~10291 | |  | | 132 | | B62 | | | 10394 | ~10396 |  |
| 98 | B28 | | 10292 | ~10294 | |  | | 133 | | B63 | | | 10397 | ~10399 |  |
| 99 | B29 | | 10295 | ~10297 | |  | | 134 | | B64 | | | 10400 | ~10402 |  |
| 100 | B30 | | 10298 | ~10300 | |  | | 135 | | B65 | | | 10403 | ~10405 |  |
| 101 | B31 | | 10301 | ~10303 | |  | | 136 | | B66 | | | 10406 | ~10408 |  |
| 102 | B32 | | 10304 | ~10306 | |  | | 137 | | B67 | | | 10409 | ~10411 |  |
| 103 | B33 | | 10307 | ~10309 | |  | | 138 | | B68 | | | 10412 | ~10414 |  |
| 104 | B34 | | 10310 | ~10312 | |  | | 139 | | B69 | | | 10415 | ~10417 |  |
| 105 | B35 | | 10313 | ~10315 | |  | | 140 | | B70 | | | 10418 | ~10420 |  |
| 序号 | 检波器编号 | | 测试记录 | | | | 备注 | | 序号 | 检波器 | | | 测试记录 | | 备注 |
| 编号 | | |
| 141 | C01 | | 10421 | | ~10423 | |  | | 176 | C36 | | | 10526 | ~10528 |  |
| 142 | C02 | | 10424 | | ~10426 | |  | | 177 | C37 | | | 10529 | ~10521 |  |
| 143 | C03 | | 10427 | | ~10429 | |  | | 178 | C38 | | | 10532 | ~10514 |  |
| 144 | C04 | | 10430 | | ~10432 | |  | | 179 | C39 | | | 10535 | ~10507 |  |
| 145 | C05 | | 10433 | | ~10435 | |  | | 180 | C40 | | | 10538 | ~10500 |  |
| 146 | C06 | | 10436 | | ~10438 | |  | | 181 | C41 | | | 10541 | ~10493 |  |
| 147 | C07 | | 10439 | | ~10441 | |  | | 182 | C42 | | | 10544 | ~10486 |  |
| 148 | C08 | | 10442 | | ~10444 | |  | | 183 | C43 | | | 10547 | ~10479 |  |
| 149 | C09 | | 10445 | | ~10447 | |  | | 184 | C44 | | | 10550 | ~10472 |  |
| 150 | C10 | | 10448 | | ~10450 | |  | | 185 | C45 | | | 10553 | ~10465 |  |
| 151 | C11 | | 10451 | | ~10453 | |  | | 186 | C46 | | | 10556 | ~10458 |  |
| 152 | C12 | | 10454 | | ~10456 | |  | | 187 | C47 | | | 10559 | ~10451 |  |
| 153 | C13 | | 10457 | | ~10459 | |  | | 188 | C48 | | | 10562 | ~10444 |  |
| 154 | C14 | | 10460 | | ~10462 | |  | | 189 | C49 | | | 10565 | ~10437 |  |
| 155 | C15 | | 10463 | | ~10465 | |  | | 190 | C50 | | | 10568 | ~10430 |  |
| 156 | C16 | | 10466 | | ~10468 | |  | | 191 | C51 | | | 10571 | ~10423 |  |
| 157 | C17 | | 10469 | | ~10471 | |  | | 192 | C52 | | | 10574 | ~10416 |  |
| 158 | C18 | | 10472 | | ~10474 | |  | | 193 | C53 | | | 10577 | ~10409 |  |
| 159 | C19 | | 10475 | | ~10477 | |  | | 194 | C54 | | | 10580 | ~10402 |  |
| 160 | C20 | | 10478 | | ~10480 | |  | | 195 | C55 | | | 10583 | ~10395 |  |
| 161 | C21 | | 10481 | | ~10483 | |  | | 196 | C56 | | | 10586 | ~10388 |  |
| 162 | C22 | | 10484 | | ~10486 | |  | | 197 | C57 | | | 10589 | ~10381 |  |
| 163 | C23 | | 10487 | | ~10489 | |  | | 198 | C58 | | | 10592 | ~10374 |  |
| 164 | C24 | | 10490 | | ~10492 | |  | | 199 | C59 | | | 10595 | ~10367 |  |
| 165 | C25 | | 10493 | | ~10495 | |  | | 200 | C60 | | | 10598 | ~10360 |  |
| 166 | C26 | | 10496 | | ~10498 | |  | | 201 | C61 | | | 10601 | ~10353 |  |
| 167 | C27 | | 10499 | | ~10501 | |  | | 202 | C62 | | | 10604 | ~10346 |  |
| 168 | C28 | | 10502 | | ~10504 | |  | | 203 | C63 | | | 10607 | ~10339 |  |
| 169 | C29 | | 10505 | | ~10507 | |  | | 204 | C64 | | | 10610 | ~10332 |  |
| 170 | C30 | | 10508 | | ~10510 | |  | | 205 | C65 | | | 10613 | ~10325 |  |
| 171 | C31 | | 10511 | | ~10513 | |  | | 206 | C66 | | | 10616 | ~10318 |  |
| 172 | C32 | | 10514 | | ~10516 | |  | | 207 | C67 | | | 10619 | ~10311 |  |
| 173 | C33 | | 10517 | | ~10519 | |  | | 208 | C68 | | | 10622 | ~10304 |  |
| 174 | C34 | | 10520 | | ~10522 | |  | | 209 | C69 | | | 10625 | ~10297 |  |
| 175 | C35 | | 10523 | | ~10525 | |  | | 210 | C70 | | | 10628 | ~10290 |  |

检波器规格型号表

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5Hz | | | | | | | | | | | | | |
| 型号 | PS-5R | | SM5 | | SG-5 | | | CD-5 | | DS-5Hz | | SN6-4.5Hz | |
| 10Hz | | | | | | | | | | | | | |
| 型号 | PS-10R | | | SM24HS | | | SG10HS | | | CD6 | | DS-10Hz | |
| 10Hz高精度 | | | | | | | | | | | | | |
| 型号 | PS-10XS | PS-10GS | HP103 | | | 30DX | | | SG10 | | CD-1 | | CD-3 |

1. 检波器测试仪SMT-300校准原始数据（节选）



1. 振动台校准原始数据（节选）
2. 

六、试验结论：

1. 参数校准：

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 序号 | 芯体编号 | **电阻（Ω）** | **频率（Hz）** | **阻尼** | **灵敏度(V/m/s)** | **失真度（%）** |
| 1 | A01 | 1.69% | -0.10% | 0.00% | -0.40% | -0.08 |
| 2 | A02 | 1.84% | -0.40% | 0.00% | -0.50% | -0.08 |
| 3 | A03 | 2.05% | -0.50% | -0.14% | -0.30% | -0.05 |
| 4 | A04 | 1.34% | -0.40% | -0.28% | -0.10% | -0.06 |
| 5 | A05 | 1.77% | -0.30% | 0.00% | -0.40% | -0.06 |
| 6 | A06 | 0.99% | -0.40% | -0.57% | -1.00% | -0.05 |
| 7 | A07 | 1.34% | -0.40% | -0.14% | -0.50% | -0.05 |
| 8 | A08 | 1.69% | -0.90% | -0.28% | -1.00% | -0.07 |
| 9 | A09 | 2.05% | 0.30% | 0.28% | 0.50% | -0.05 |
| 10 | A10 | 2.05% | -0.70% | 0.42% | -0.70% | -0.05 |
| 11 | A11 | 2.40% | -0.30% | -0.42% | 0.10% | -0.06 |
| 12 | A12 | 1.62% | 0.00% | -0.71% | 0.00% | -0.09 |
| 13 | A13 | 1.69% | -0.10% | 0.57% | 0.30% | -0.09 |
| 14 | A14 | 1.69% | -0.20% | 0.14% | 0.70% | -0.08 |
| 15 | A15 | 0.99% | -0.20% | -0.57% | 0.50% | -0.07 |
| 16 | A16 | 0.99% | 0.00% | 0.99% | 0.80% | -0.08 |
| 17 | A17 | 2.68% | 0.50% | -0.28% | 0.65% | -0.06 |
| 18 | A18 | 1.69% | -0.90% | 0.00% | 0.00% | -0.05 |
| 19 | A19 | 3.58% | -0.10% | -0.57% | -1.04% | -0.07 |
| 20 | A20 | 2.40% | 0.00% | 0.28% | -0.20% | -0.07 |
| 21 | A21 | 0.92% | -0.60% | 0.14% | 0.10% | -0.07 |
| 22 | A22 | 0.28% | -0.20% | 0.00% | 1.00% | -0.07 |
| 23 | A23 | 0.64% | -0.90% | 0.99% | 0.50% | -0.08 |
| 24 | A24 | 0.92% | -0.30% | -0.42% | 0.20% | -0.06 |
| 25 | A25 | 1.34% | -0.20% | 0.28% | 0.40% | -0.07 |
| 26 | A26 | 1.34% | -0.30% | 1.41% | 1.00% | -0.04 |
| 27 | A27 | 0.92% | -0.60% | 0.28% | -0.20% | -0.08 |
| 28 | A28 | 0.64% | 0.10% | 0.85% | 0.90% | -0.05 |
| 29 | A29 | 0.64% | -0.20% | 0.57% | 1.00% | -0.03 |
| 30 | A30 | 1.06% | -0.10% | 0.42% | 0.10% | -0.06 |
| 31 | A31 | -0.42% | -0.70% | 0.57% | 0.40% | -0.05 |
| 32 | A32 | -0.78% | -0.30% | 0.71% | 0.50% | -0.08 |
| 33 | A33 | -0.49% | -0.40% | 1.27% | 0.90% | -0.09 |
| 34 | A34 | -0.78% | 0.80% | 0.14% | 0.30% | -0.07 |
| 35 | A35 | -1.13% | -0.40% | 1.13% | 0.40% | -0.07 |
| 36 | A36 | -0.42% | 0.20% | 0.28% | 0.80% | -0.08 |
| 37 | A37 | -1.13% | 1.00% | 0.28% | 0.50% | -0.07 |
| 38 | A38 | -0.78% | -0.10% | 0.99% | 0.40% | -0.09 |
| 39 | A39 | -0.42% | 0.20% | 0.71% | 0.30% | -0.07 |
| 40 | A40 | 0.14% | 0.10% | 1.27% | 0.80% | -0.08 |
| 41 | A41 | 1.34% | -0.30% | -0.28% | 0.20% | -0.08 |
| 42 | A42 | 0.28% | 0.20% | 0.00% | 0.00% | -0.07 |
| 43 | A43 | 0.64% | -0.20% | -0.28% | -0.30% | -0.07 |
| 44 | A44 | 1.69% | -0.60% | -0.57% | -0.50% | -0.09 |
| 45 | A45 | 0.64% | 0.00% | 0.00% | 0.20% | -0.06 |
| 46 | A46 | 0.28% | -0.30% | -0.14% | -0.20% | -0.06 |
| 47 | A47 | 0.92% | -0.60% | -0.14% | -0.40% | -0.07 |
| 48 | A48 | 0.99% | -0.30% | -0.42% | 0.50% | -0.07 |
| 49 | A49 | 0.99% | -0.30% | -0.42% | -0.10% | -0.09 |
| 50 | A50 | 1.34% | -1.00% | -0.57% | -0.50% | -0.08 |
| 51 | A51 | -0.07% | -0.30% | -0.14% | 0.60% | -0.09 |
| 52 | A52 | -0.14% | 0.10% | -0.57% | 0.20% | -0.08 |
| 53 | A53 | -0.42% | -0.50% | -0.28% | 0.50% | -0.09 |
| 54 | A54 | -0.42% | 0.00% | -0.42% | 0.40% | -0.09 |
| 55 | A55 | -0.14% | -0.10% | -0.57% | 0.20% | -0.06 |
| 56 | A56 | -0.07% | -0.30% | -0.28% | 0.30% | -0.07 |
| 57 | A57 | 0.28% | 0.00% | -0.42% | 0.00% | -0.08 |
| 58 | A58 | -0.07% | -0.70% | -0.28% | 0.60% | -0.09 |
| 59 | A59 | 0.28% | 0.40% | -0.42% | 0.00% | -0.08 |
| 60 | A60 | 0.21% | -0.30% | -0.57% | -0.20% | -0.08 |
| 61 | A61 | 1.69% | 0.80% | -0.57% | 0.40% | -0.08 |
| 62 | A62 | 1.34% | 0.90% | -0.85% | -0.20% | -0.07 |
| 63 | A63 | 1.41% | 0.40% | -0.28% | 0.20% | -0.08 |
| 64 | A64 | 1.34% | 0.40% | -0.71% | -0.30% | -0.08 |
| 65 | A65 | 0.64% | 0.90% | 0.00% | 0.50% | -0.08 |
| 66 | A66 | 1.20% | 0.40% | 0.00% | 0.20% | -0.08 |
| 67 | A67 | 0.99% | 0.40% | -0.57% | -0.30% | -0.07 |
| 68 | A68 | 0.64% | 0.60% | -0.99% | 0.40% | -0.08 |
| 69 | A69 | 0.64% | 0.00% | -0.71% | -0.10% | -0.04 |
| 70 | A70 | 0.64% | 0.50% | -0.28% | 0.00% | -0.07 |
| 71 | B01 | 0.58% | -1.00% | -4.50% | -0.27% | -0.06 |
| 72 | B02 | -0.19% | -1.40% | -1.00% | -0.82% | -0.06 |
| 73 | B03 | 0.11% | -0.20% | -4.00% | -0.02% | -0.05 |
| 74 | B04 | -2.14% | -1.80% | -3.00% | -0.02% | -0.08 |
| 75 | B05 | -1.02% | -0.20% | -2.00% | -1.33% | -0.07 |
| 76 | B06 | -1.12% | -1.80% | -0.67% | -1.13% | -0.05 |
| 77 | B07 | 0.16% | -2.80% | -0.17% | -0.68% | -0.06 |
| 78 | B08 | -0.66% | -2.40% | -1.50% | -0.45% | -0.06 |
| 79 | B09 | 0.89% | -1.60% | -2.67% | -2.58% | -0.07 |
| 80 | B10 | 0.72% | -2.20% | -1.50% | 0.57% | -0.07 |
| 81 | B11 | 1.24% | -0.60% | -0.33% | 0.00% | -0.07 |
| 82 | B12 | 0.35% | -0.20% | -0.17% | -0.25% | -0.07 |
| 83 | B13 | 0.89% | 1.00% | -2.67% | -0.20% | -0.05 |
| 84 | B14 | 0.51% | -1.00% | -0.17% | -0.45% | -0.08 |
| 85 | B15 | 0.96% | -0.40% | -0.17% | 0.70% | -0.07 |
| 86 | B16 | 0.88% | 0.00% | -1.33% | -0.15% | -0.07 |
| 87 | B17 | -0.10% | -1.20% | -0.67% | 0.02% | -0.06 |
| 88 | B18 | -0.08% | -0.80% | -1.33% | -0.27% | -0.07 |
| 89 | B19 | 0.84% | -1.20% | 0.17% | 0.02% | -0.08 |
| 90 | B20 | 0.04% | -1.60% | 0.17% | -0.60% | -0.08 |
| 91 | B21 | -0.43% | -4.20% | 3.00% | 0.29% | -0.05 |
| 92 | B22 | 0.63% | -4.00% | 1.50% | -0.08% | -0.07 |
| 93 | B23 | 0.02% | -4.60% | 3.00% | 0.35% | -0.06 |
| 94 | B24 | -0.93% | -3.60% | 3.50% | -0.05% | -0.07 |
| 95 | B25 | -0.55% | -4.20% | 2.33% | -0.15% | -0.06 |
| 96 | B26 | -0.28% | -4.40% | 4.00% | 2.15% | -0.08 |
| 97 | B27 | -0.26% | -3.00% | 1.67% | 1.85% | -0.08 |
| 98 | B28 | -1.64% | -4.20% | 1.67% | 0.12% | -0.08 |
| 99 | B29 | -0.04% | -4.20% | 0.50% | -0.72% | -0.06 |
| 100 | B30 | -0.44% | -3.80% | 2.83% | 0.05% | -0.07 |
| 101 | B31 | 3.37% | -1.40% | 0.33% | -0.57% | -0.07 |
| 102 | B32 | 1.02% | -0.80% | 0.67% | -0.05% | -0.08 |
| 103 | B33 | 1.02% | -1.00% | -0.50% | 0.20% | -0.07 |
| 104 | B34 | 0.99% | -1.60% | 0.83% | 0.23% | -0.08 |
| 105 | B35 | 1.47% | -0.80% | 0.83% | 0.90% | -0.08 |
| 106 | B36 | 1.05% | -1.00% | -0.17% | 0.53% | -0.08 |
| 107 | B37 | 1.20% | -1.40% | 0.33% | 0.55% | -0.08 |
| 108 | B38 | 1.05% | -1.20% | -0.83% | 0.57% | -0.07 |
| 109 | B39 | 1.50% | -1.20% | 0.17% | 0.55% | -0.08 |
| 110 | B40 | 1.84% | -0.40% | 0.83% | 1.15% | -0.07 |
| 111 | B41 | -0.03% | -1.60% | -0.33% | -0.18% | -0.07 |
| 112 | B42 | -0.35% | -1.00% | 0.17% | 0.53% | -0.07 |
| 113 | B43 | -0.25% | -1.00% | -0.17% | 0.78% | -0.07 |
| 114 | B44 | -0.57% | -0.20% | 0.83% | 1.05% | -0.07 |
| 115 | B45 | -0.41% | -0.60% | 0.33% | 0.75% | -0.07 |
| 116 | B46 | -0.79% | -1.40% | -0.33% | 0.33% | -0.08 |
| 117 | B47 | -0.50% | -0.80% | 0.83% | 0.85% | -0.07 |
| 118 | B48 | -0.70% | -1.00% | 0.67% | 0.75% | -0.07 |
| 119 | B49 | 0.54% | 0.40% | -0.50% | 1.08% | -0.07 |
| 120 | B50 | -0.49% | -0.60% | 0.33% | 1.13% | -0.07 |
| 121 | B51 | 0.00% | -0.20% | -1.00% | -0.53% | -0.08 |
| 122 | B52 | 0.10% | 0.40% | -0.83% | -0.77% | -0.09 |
| 123 | B53 | 0.24% | 0.00% | -1.17% | -0.41% | -0.08 |
| 124 | B54 | 0.33% | -0.20% | -1.17% | -1.01% | -0.09 |
| 125 | B55 | -0.03% | 0.20% | -1.17% | -0.46% | -0.09 |
| 126 | B56 | 0.14% | 0.00% | -1.00% | -0.31% | -0.09 |
| 127 | B57 | 0.20% | -0.40% | -1.17% | -0.94% | -0.09 |
| 128 | B58 | 0.60% | -0.40% | -0.83% | -0.72% | -0.08 |
| 129 | B59 | -0.06% | 0.20% | -1.00% | -0.60% | -0.08 |
| 130 | B60 | -0.20% | -0.20% | -1.00% | -0.38% | -0.09 |
| 131 | B61 | 0.75% | 2.60% | 0.50% | 1.00% | -0.07 |
| 132 | B62 | 0.45% | 1.80% | 0.50% | 0.60% | -0.08 |
| 133 | B63 | 0.76% | 1.20% | 1.33% | 2.03% | -0.08 |
| 134 | B64 | 1.37% | 2.60% | -0.83% | 0.45% | -0.08 |
| 135 | B65 | 1.81% | -0.40% | -1.67% | -0.08% | -0.07 |
| 136 | B66 | 1.17% | 3.80% | -1.00% | 1.08% | -0.08 |
| 137 | B67 | -0.04% | 1.00% | -1.17% | -0.25% | -0.08 |
| 138 | B68 | 1.60% | 1.20% | -1.50% | 0.00% | -0.08 |
| 139 | B69 | 0.26% | 2.40% | 0.33% | 2.10% | -0.08 |
| 140 | B70 | 1.99% | 2.80% | -0.67% | 1.25% | -0.07 |
| 141 | C01 | 0.13% | -0.60% | -0.20% | 0.47% | -0.06 |
| 142 | C02 | 0.11% | -0.30% | 1.57% | 0.23% | -0.06 |
| 143 | C03 | 1.28% | -0.90% | -2.55% | -2.10% | -0.06 |
| 144 | C04 | 1.61% | -1.90% | -1.57% | -1.52% | -0.06 |
| 145 | C05 | 0.56% | -0.90% | 0.78% | -0.93% | -0.06 |
| 146 | C06 | 0.16% | -0.60% | -1.76% | -0.26% | -0.06 |
| 147 | C07 | 0.81% | -0.50% | 0.20% | -0.14% | -0.06 |
| 148 | C08 | 0.86% | -1.20% | -1.18% | -0.82% | -0.06 |
| 149 | C09 | 0.87% | -0.70% | 0.78% | 0.09% | -0.06 |
| 150 | C10 | 0.94% | -0.50% | 0.00% | -0.14% | -0.06 |
| 151 | C11 | 3.69% | -0.40% | -6.47% | -1.35% | -0.06 |
| 152 | C12 | 3.17% | 0.90% | -6.86% | -0.44% | -0.06 |
| 153 | C13 | 3.19% | 1.10% | -9.41% | -0.61% | -0.06 |
| 154 | C14 | 3.12% | -0.50% | 40.39% | -0.79% | -0.06 |
| 155 | C15 | 3.77% | -1.40% | -7.06% | -1.31% | -0.06 |
| 156 | C16 | 4.13% | 0.20% | -7.06% | -1.63% | -0.06 |
| 157 | C17 | 3.79% | -0.70% | -7.65% | -1.59% | -0.06 |
| 158 | C18 | 3.39% | 0.30% | -9.41% | -1.59% | -0.06 |
| 159 | C19 | 4.34% | -1.10% | -7.25% | -1.66% | -0.06 |
| 160 | C20 | 4.40% | 0.00% | -8.43% | -1.45% | -0.06 |
| 161 | C21 | 0.64% | 0.10% | 0.43% | 0.30% | -0.06 |
| 162 | C22 | 0.69% | 0.20% | 0.86% | 0.74% | -0.06 |
| 163 | C23 | 0.96% | -0.30% | 0.43% | -0.25% | -0.06 |
| 164 | C24 | 1.56% | -0.30% | 0.71% | -0.28% | -0.06 |
| 165 | C25 | 1.34% | -0.10% | 0.57% | -0.10% | -0.06 |
| 166 | C26 | 1.32% | 0.10% | 0.00% | 0.05% | -0.06 |
| 167 | C27 | 0.52% | -0.20% | 1.14% | -0.25% | -0.06 |
| 168 | C28 | 1.17% | -0.90% | 0.86% | -0.61% | -0.06 |
| 169 | C29 | 1.32% | -0.70% | 0.57% | -0.38% | -0.06 |
| 170 | C30 | 1.83% | 0.20% | -0.57% | -0.18% | -0.06 |
| 171 | C31 | 0.33% | 0.10% | -0.39% | 0.19% | -0.06 |
| 172 | C32 | -0.14% | -0.10% | -1.18% | -0.33% | -0.06 |
| 173 | C33 | 0.01% | -0.40% | -0.98% | -0.14% | -0.06 |
| 174 | C34 | 0.08% | 0.00% | -1.57% | -0.58% | -0.06 |
| 175 | C35 | 0.36% | -0.20% | -0.59% | -0.09% | -0.06 |
| 176 | C36 | 0.52% | 0.40% | -1.18% | -0.19% | -0.06 |
| 177 | C37 | 0.04% | -0.30% | -0.98% | 0.02% | -0.06 |
| 178 | C38 | 0.36% | -0.20% | -1.96% | -0.70% | -0.06 |
| 179 | C39 | 0.82% | -0.70% | -0.59% | -0.26% | -0.06 |
| 180 | C40 | 0.71% | -0.30% | -0.59% | -0.12% | -0.06 |
| 181 | C41 | 0.87% | -0.80% | -0.71% | -0.35% | -0.06 |
| 182 | C42 | 0.28% | -0.60% | -0.36% | -0.16% | -0.06 |
| 183 | C43 | -0.23% | -0.40% | -0.36% | -0.26% | -0.06 |
| 184 | C44 | -0.01% | -0.40% | -0.36% | 0.00% | -0.06 |
| 185 | C45 | 0.09% | 0.10% | -0.71% | 0.35% | -0.06 |
| 186 | C46 | 0.72% | -0.40% | -0.71% | 0.12% | -0.06 |
| 187 | C47 | 0.32% | -0.30% | -0.54% | -0.47% | -0.06 |
| 188 | C48 | 0.58% | -0.40% | -0.54% | 0.30% | -0.06 |
| 189 | C49 | 0.23% | -0.90% | -0.54% | -0.23% | -0.06 |
| 190 | C50 | -0.18% | -0.90% | -0.89% | -0.37% | -0.06 |
| 191 | C51 | 0.88% | -0.10% | -0.71% | 0.05% | -0.06 |
| 192 | C52 | 0.19% | -0.20% | -0.89% | 0.02% | -0.06 |
| 193 | C53 | 0.33% | -0.10% | -0.36% | -0.07% | -0.06 |
| 194 | C54 | 0.16% | -0.10% | -0.36% | -0.28% | -0.06 |
| 195 | C55 | -0.11% | 0.00% | -0.36% | -0.09% | -0.06 |
| 196 | C56 | 0.50% | -0.20% | 0.18% | 0.05% | -0.06 |
| 197 | C57 | -0.34% | -0.40% | 0.36% | -0.07% | -0.06 |
| 198 | C58 | -0.17% | -0.20% | -0.18% | 0.19% | -0.06 |
| 199 | C59 | 0.22% | 0.00% | 0.00% | 0.09% | -0.06 |
| 200 | C60 | 0.28% | 0.10% | -0.54% | -0.05% | -0.06 |
| 201 | C61 | 0.18% | 0.50% | 0.00% | 0.30% | -0.06 |
| 202 | C62 | 0.83% | 1.00% | -0.98% | -0.16% | -0.06 |
| 203 | C63 | 0.62% | 0.60% | 0.78% | -0.14% | -0.06 |
| 204 | C64 | 0.48% | 0.90% | -0.59% | 0.33% | -0.06 |
| 205 | C65 | 1.53% | 0.20% | -0.20% | 0.05% | -0.06 |
| 206 | C66 | 0.80% | 0.60% | -1.18% | -0.02% | -0.06 |
| 207 | C67 | 0.64% | 0.20% | -0.98% | -0.05% | -0.06 |
| 208 | C68 | 0.94% | 0.50% | -0.78% | -0.19% | -0.06 |
| 209 | C69 | 0.94% | 0.50% | 0.00% | 0.44% | -0.06 |
| 210 | C70 | 1.23% | 0.30% | -0.78% | 0.00% | -0.06 |

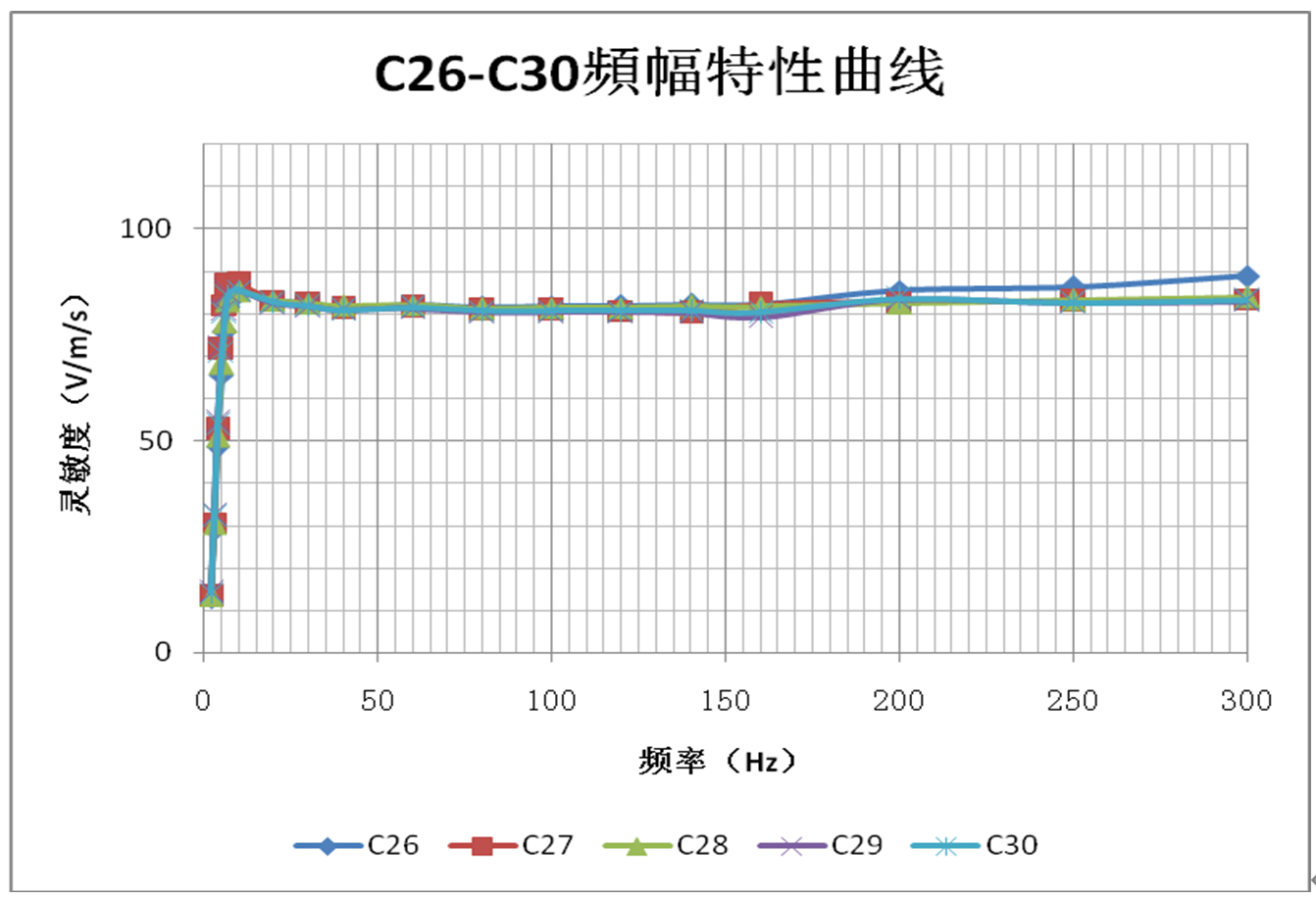
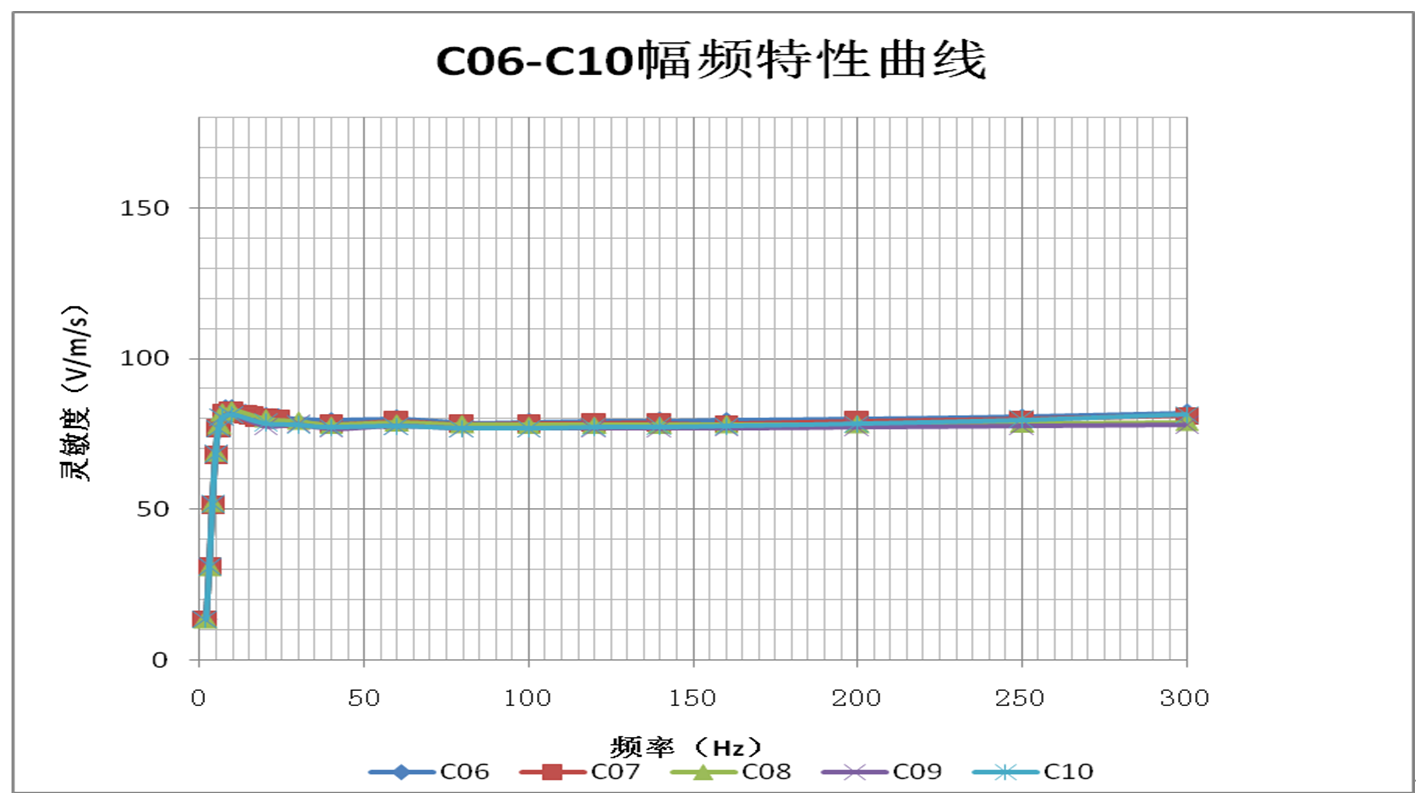
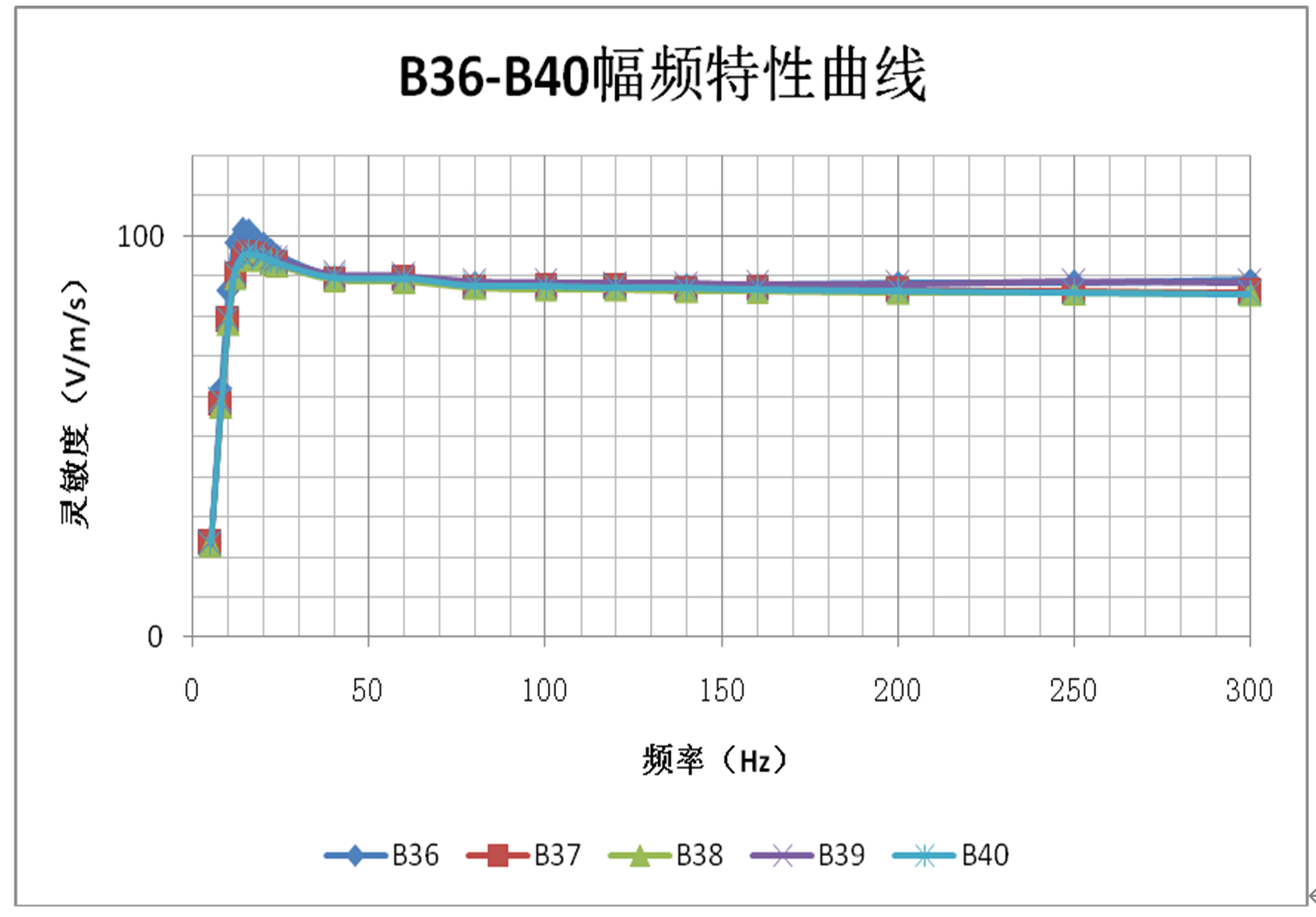
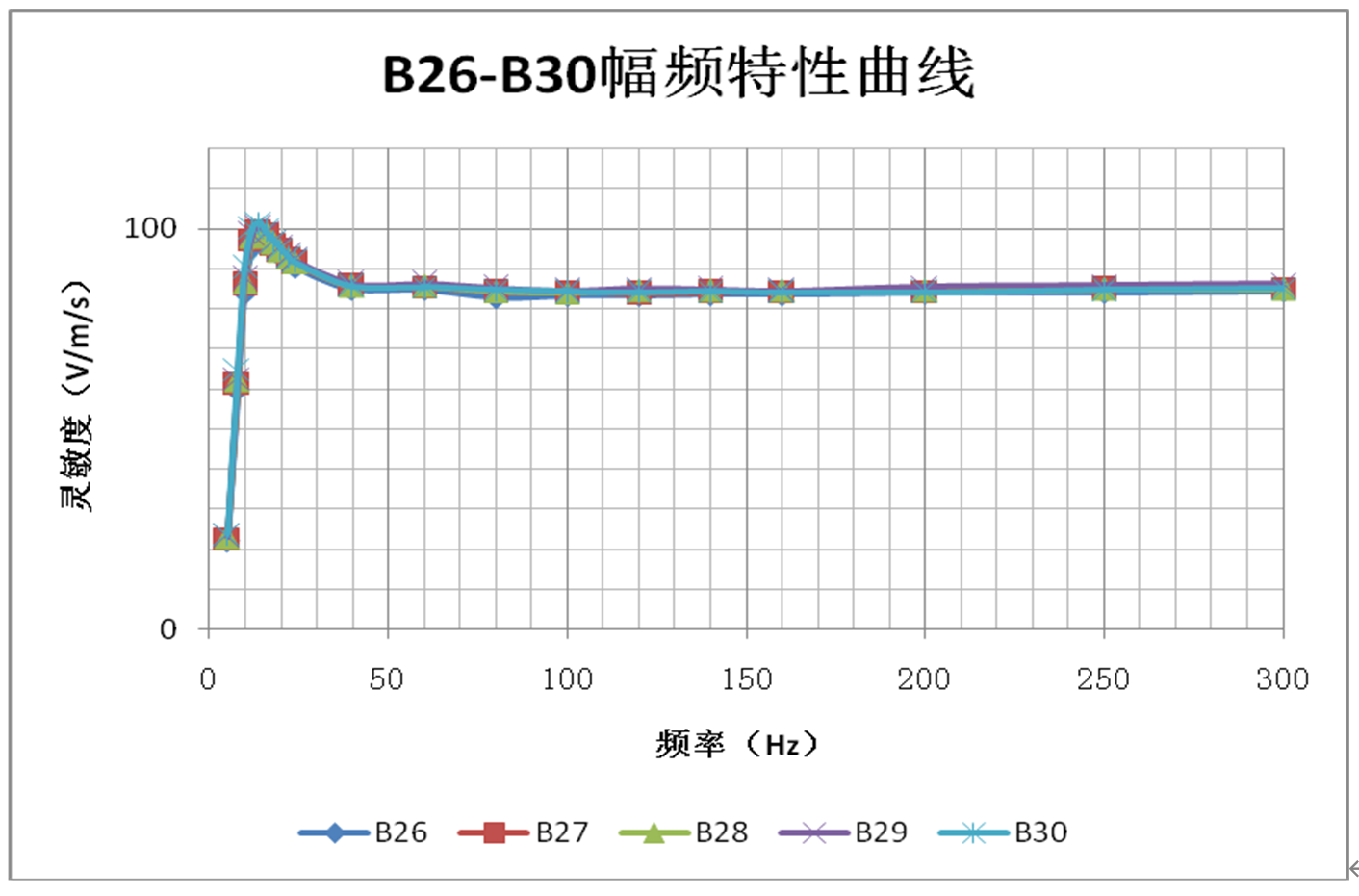
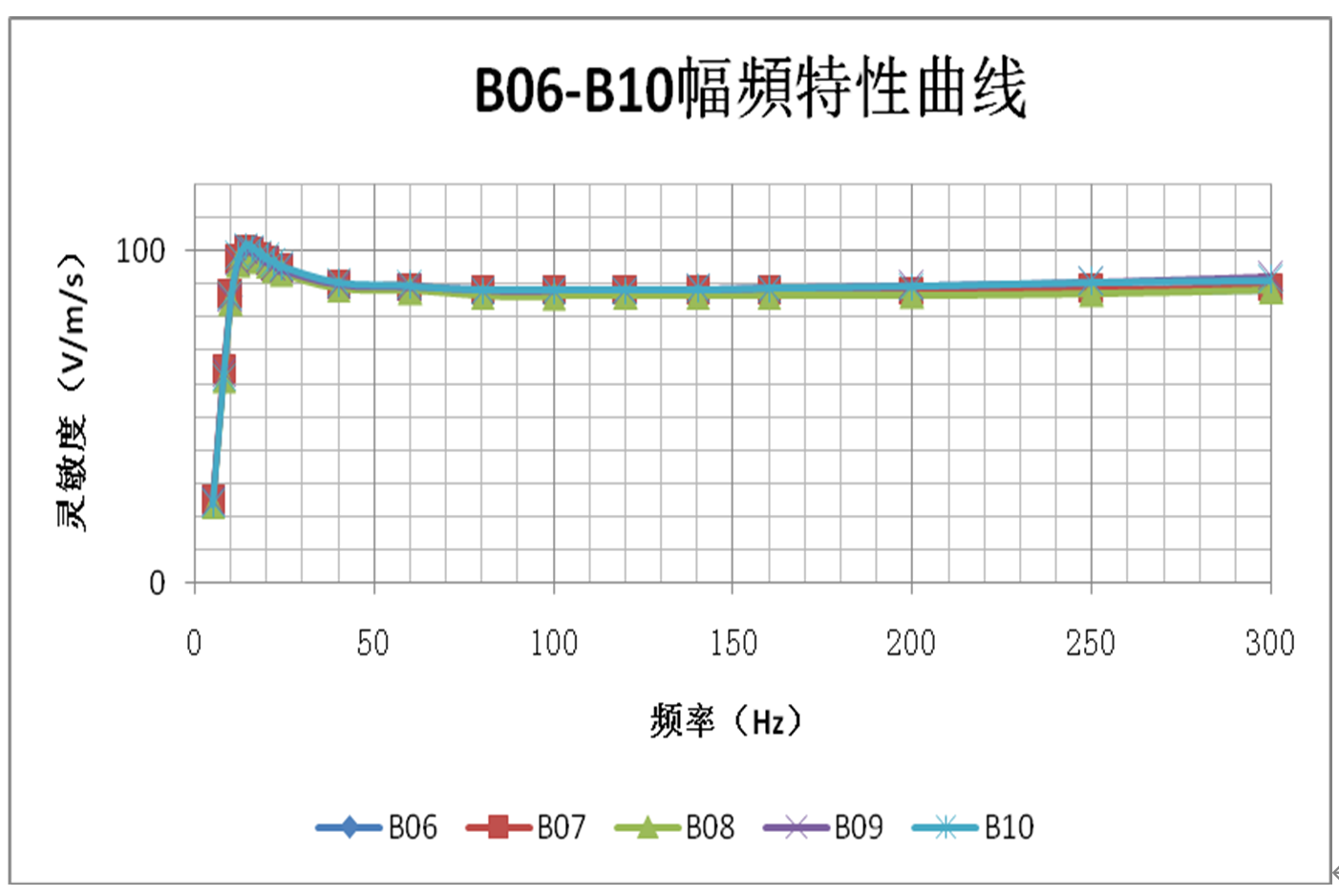
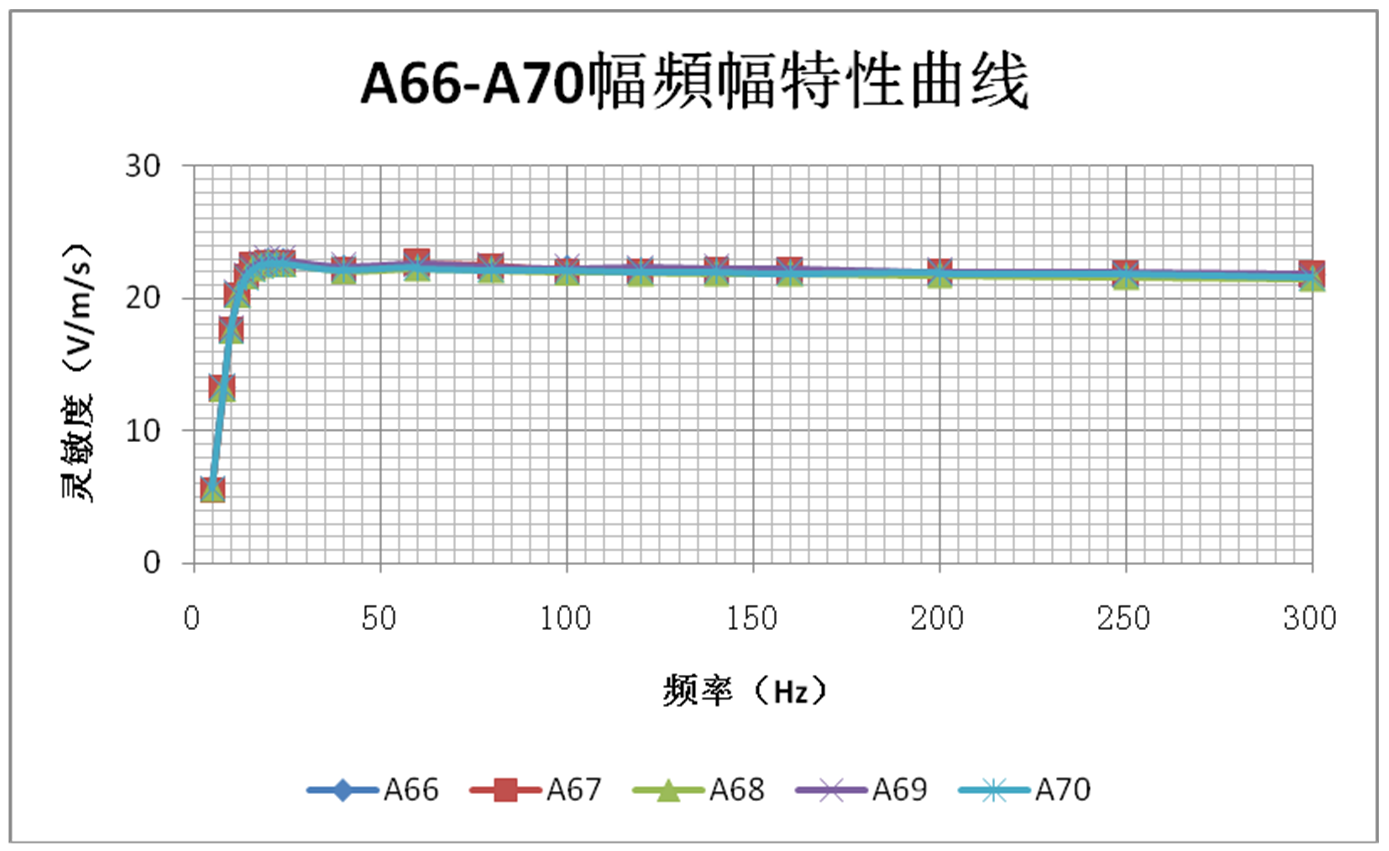
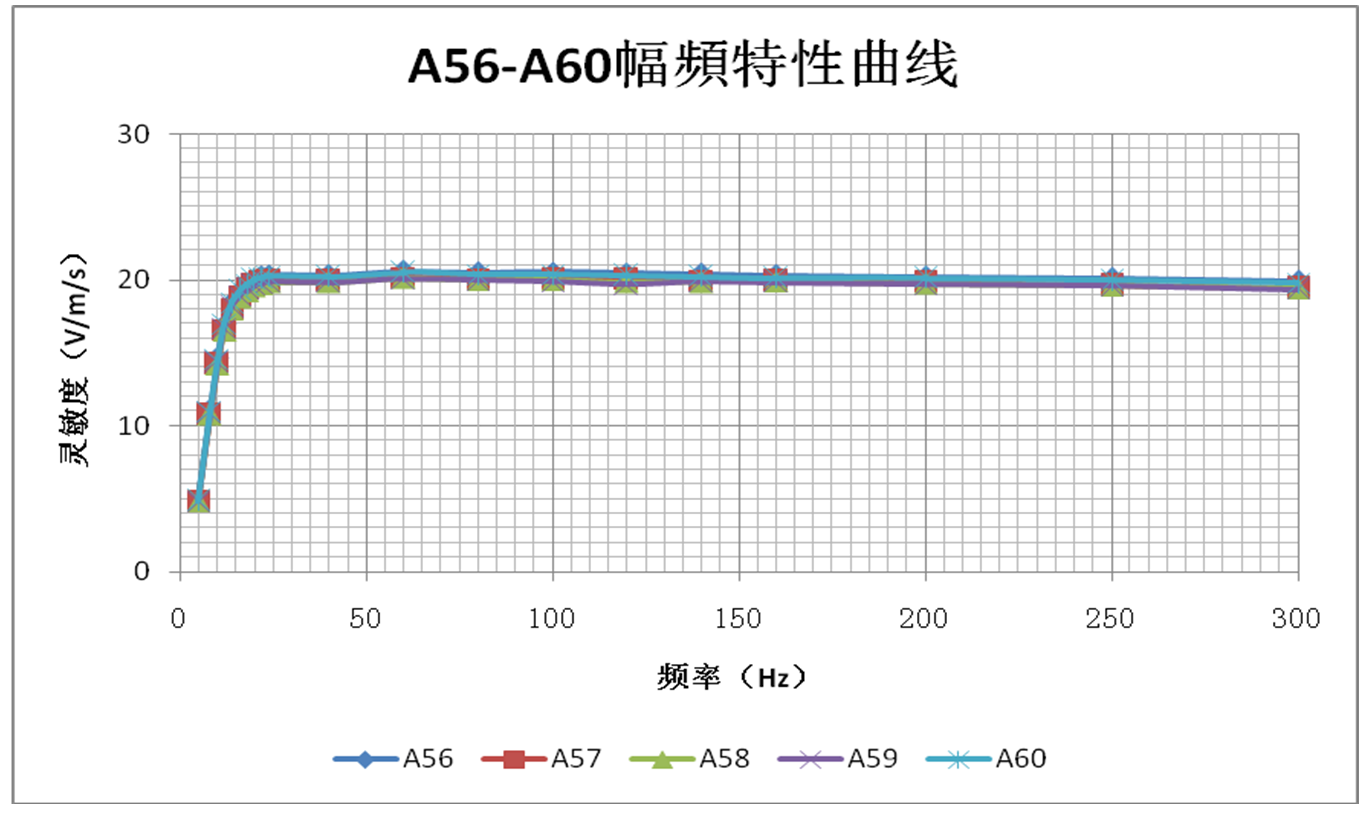
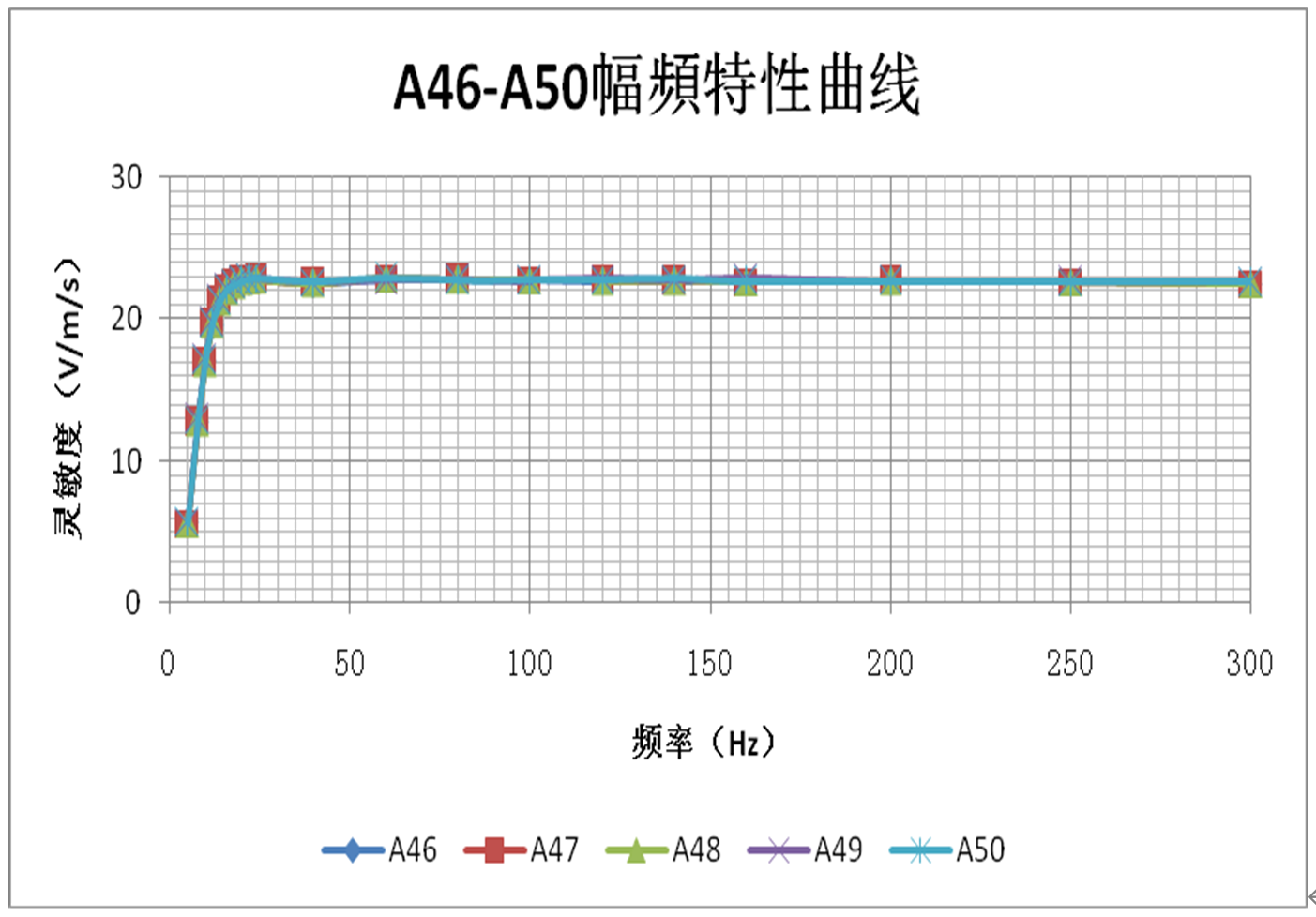
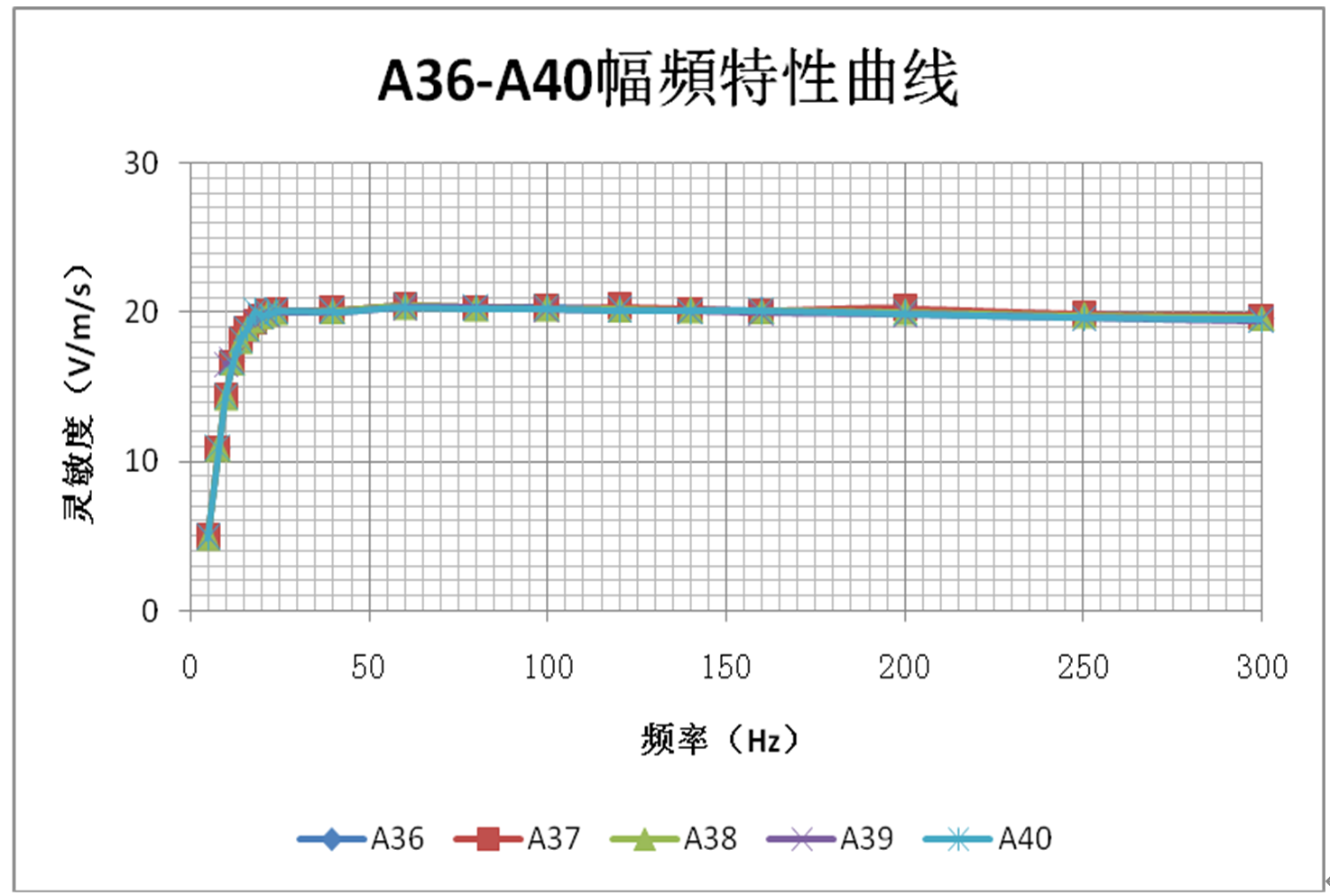
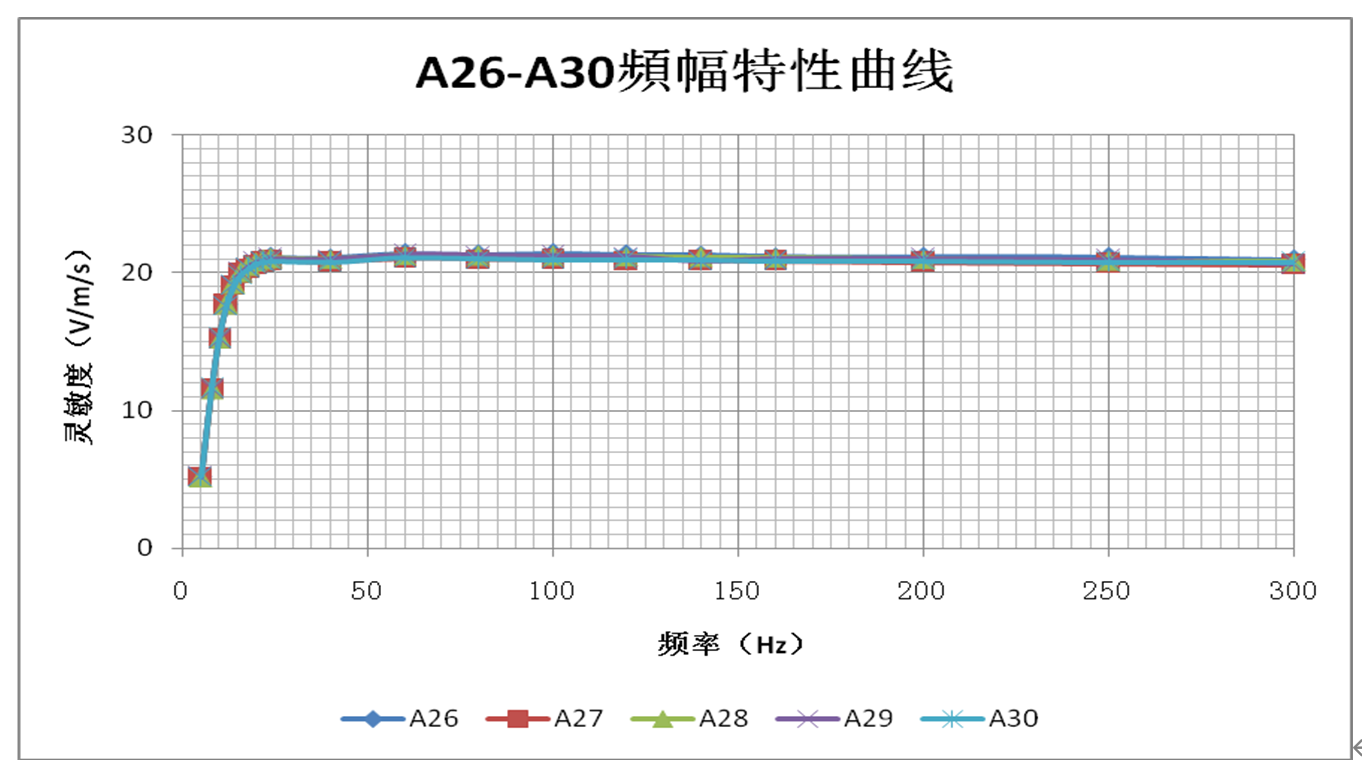
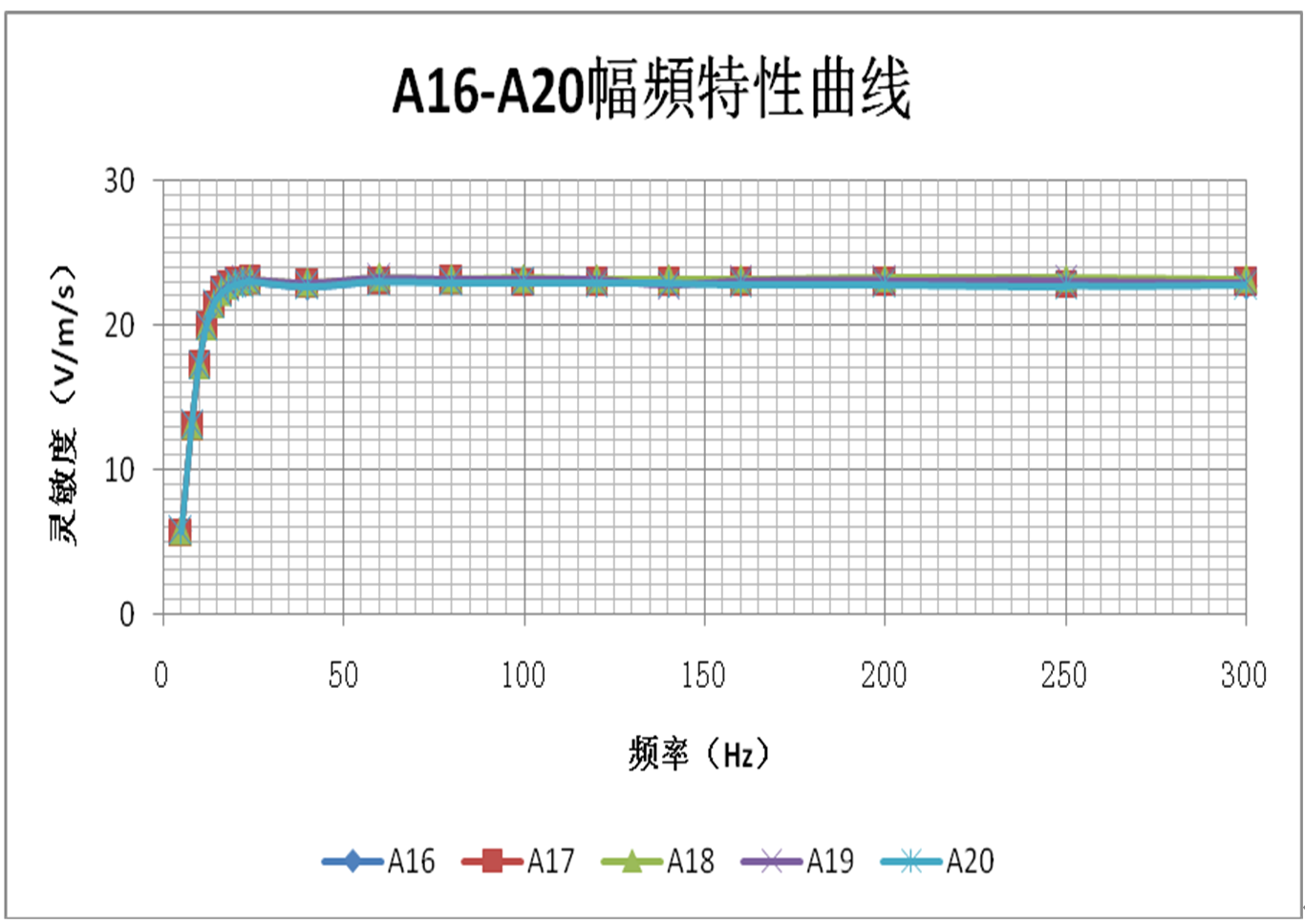
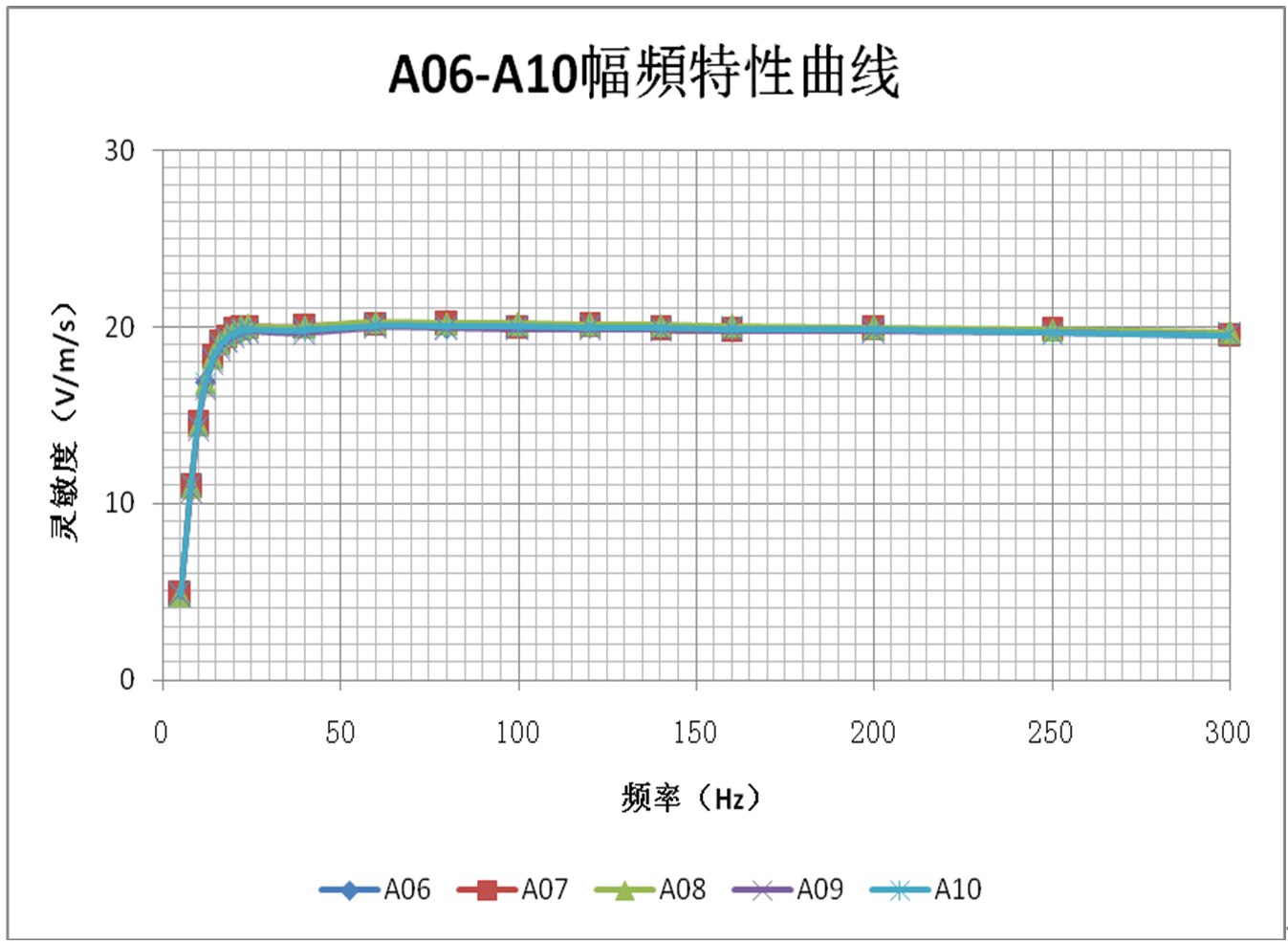
1. 倾角校准

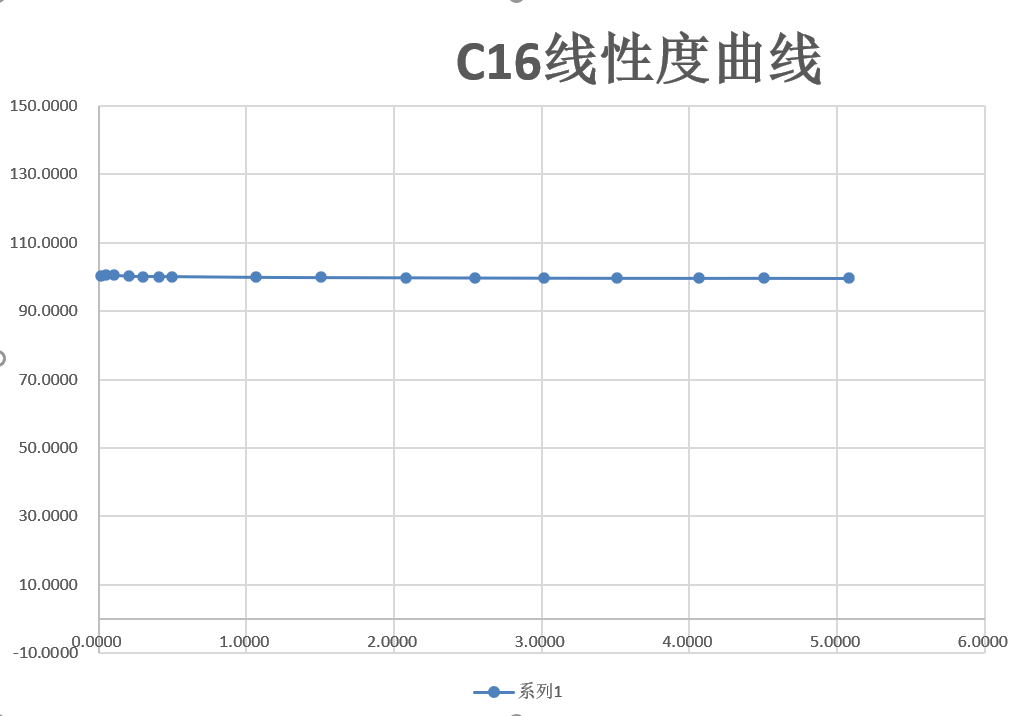
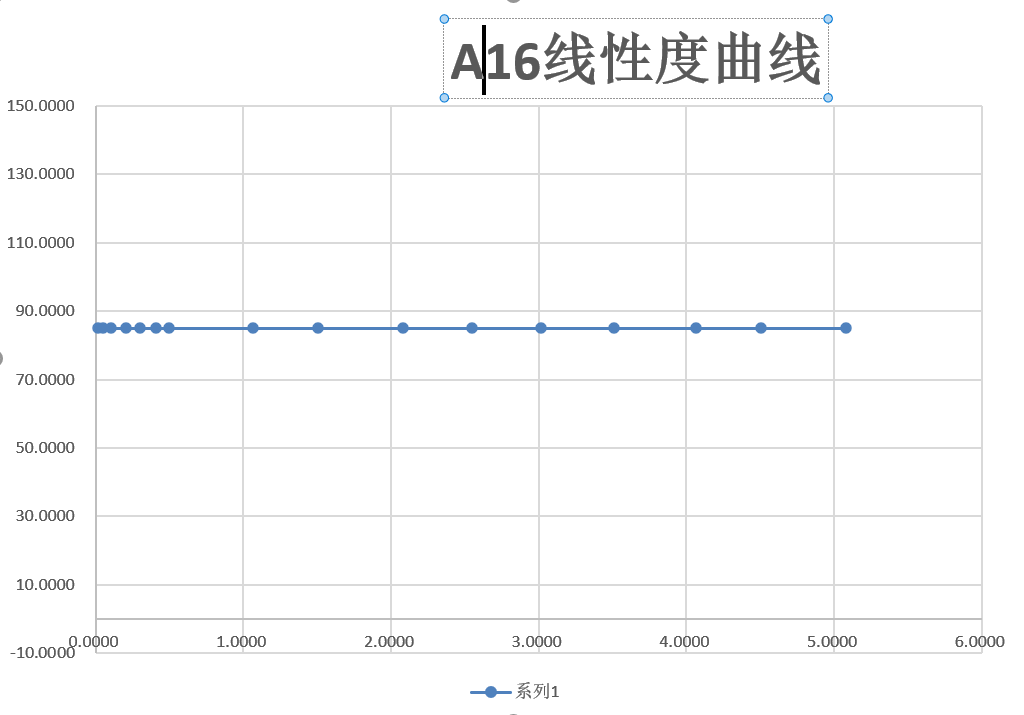
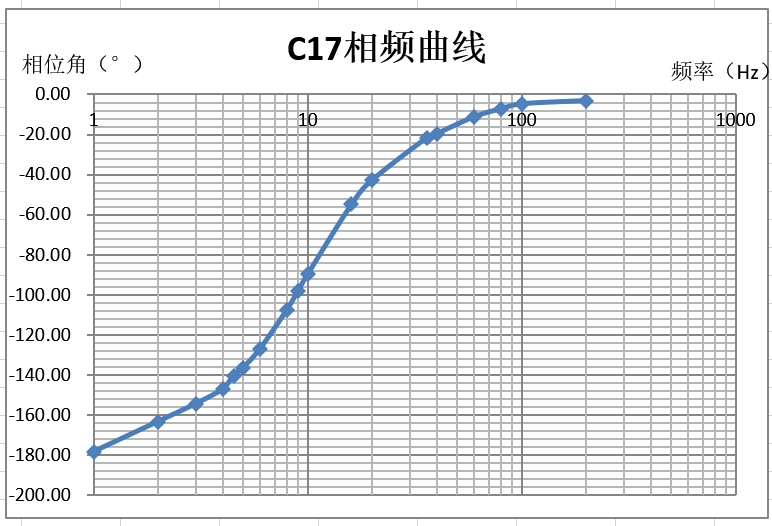
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 倾角测试结果 | | | | |
|  | 检波器编号 | 15° | 20° | 25° |
| 序号 | 编号 | 20° | 25° | 30° |
| 1 | A06 | P | P | Bt、D |
| 2 | A07 | P | P | Bt、D |
| 3 | A08 | P | P | D |
| 4 | A09 | P | Bt、D | Bt、D |
| 5 | A10 | P | P | D |
| 6 | A16 | P | P | D |
| 7 | A17 | / | / | / |
| 8 | A18 | P | P | D |
| 9 | A19 | / | / | / |
| 10 | A20 | P | P | D |
| 11 | A26 | P | D | D |
| 12 | A27 | P | P | D |
| 13 | A28 | P | D | D |
| 14 | A29 | P | D | D |
| 15 | A30 | P | D | D |
| 16 | A36 | P | P | P |
| 17 | A37 | P | P | P |
| 18 | A38 | P | P | P |
| 19 | A39 | P | P | P |
| 20 | A40 | P | P | P |
| 21 | A46 | P | P | D |
| 22 | A47 | P | P | D |
| 23 | A48 | P | P | D |
| 24 | A49 | P | P | D |
| 25 | A50 | P | P | D |
| 26 | A56 | P | P | D |
| 27 | A57 | P | P | D |
| 28 | A58 | P | P | D |
| 29 | A59 | P | P | D |
| 30 | A60 | P | D | D |
| 31 | A66 | P | D | D |
| 32 | A67 | D | D | D |
| 33 | A68 | D | D | D |
| 34 | A69 | P | D | D |
| 35 | A70 | D | D | D |
| 序号 | 编号 | 15° | 20° | 25° |
| 36 | B06 | F | P | Bt |
| 37 | B07 | F | F | Bt |
| 38 | B08 | F | Bt | Bt |
| 39 | B09 | P | Bt | Bt |
| 40 | B10 | F | Bt | Bt |
| 41 | B16 | F、Bt | F、Bt | F、Bt、D |
| 42 | B17 | F、Bt | F、Bt | F、Bt、D |
| 43 | B18 | F、Bt | F、Bt | F、Bt、D |
| 44 | B19 | F、Bt | F、Bt | F、Bt、D |
| 45 | B20 | F、Bt | F、Bt | F、Bt、D |
| 46 | B26 | P | D | Bt、D |
| 47 | B27 | P | D | Bt、D |
| 48 | B28 | F | D | Bt、D |
| 49 | B29 | P | Bt、D | F、Bt、D |
| 50 | B30 | F | D | Bt、D |
| 51 | B36 | P | P | F、Bt、D |
| 52 | B37 | P | P | Bt、D |
| 53 | B38 | P | P | F、Bt、D |
| 54 | B39 | P | P | Bt、D |
| 55 | B40 | P | P | F、Bt、D |
| 56 | B46 | P | P | Bt |
| 57 | B47 | P | P | Bt |
| 58 | B48 | P | P | Bt、D |
| 59 | B49 | P | P | Bt、D |
| 60 | B50 | P | P | F、Bt、D |
| 61 | B56 | P | P | Bt |
| 62 | B57 | P | P | Bt |
| 63 | B58 | P | P | Bt |
| 64 | B59 | P | P | Bt |
| 65 | B60 | P | P | Bt |
| 66 | B66 | D | D | D |
| 67 | B67 | D | D | D |
| 68 | B68 | D | D | F、Bt、S、D |
| 69 | B69 | D | D | D |
| 70 | B70 | D | D | D |
| 序号 | 编号 | 20° | 25° | 30° |
| 71 | C06 | P | D | D |
| 72 | C07 | P | D | D |
| 73 | C08 | P | D | D |
| 74 | C09 | P | D | D |
| 75 | C10 | P | P | D |
| 76 | C26 | P | P | P |
| 77 | C27 | P | P | P |
| 78 | C28 | P | P | P |
| 79 | C29 | P | P | P |
| 80 | C30 | P | P | P |
| 81 | C36 | P | P | P |
| 82 | C37 | P | P | P |
| 83 | C38 | P | P | Bt |
| 84 | C39 | P | P | P |
| 85 | C40 | P | P | P |
| 86 | C46 | P | P | P |
| 87 | C47 | P | P | P |
| 88 | C48 | P | P | P |
| 89 | C49 | P | P | P |
| 90 | C50 | P | P | P |
| 91 | C56 | P | P | P |
| 92 | C57 | P | P | P |
| 93 | C58 | P | P | F、Bt、D |
| 94 | C59 | P | P | P |
| 95 | C60 | P | P | P |
| 96 | C66 | P | P | P |
| 97 | C67 | P | P | P |
| 98 | C68 | P | P | P |
| 99 | C69 | P | P | P |
| 100 | C70 | P | P | P |
| 注：表中判断以客户提供的《主要技术要求或技术方案》中的6.2招标技术要求为依据。表中①“P”表示测试结果符合；②“F”表示测试结果中频率值超出要求；③“Bt”表示测试结果中阻尼值超出要求；④“D”表示测试结果中失真度超出要求；⑤“S”表示测试结果中灵敏度超出要求；⑥“/”表示基础测试值超出要求，这里并未进行测试。 | | | | |

1. 假频校准

|  |  |  |  |
| --- | --- | --- | --- |
| 假频测试结果 | | | |
| 序号 | 芯体编号 | 测试结果 | 备注 |
| 1 | A06 | 245 | PASS |
| 2 | A16 | 241 | PASS |
| 3 | A26 | 241 | PASS |
| 4 | A36 | 245 | PASS |
| 5 | A46 | 247 | PASS |
| 6 | A56 | 223 |  |
| 7 | A66 | 203 |  |
| 8 | B06 | 196 |  |
| 9 | B16 | 138 |  |
| 10 | B26 | 84 |  |
| 11 | B36 | 55 |  |
| 12 | B46 | 174 |  |
| 13 | B56 | 170 |  |
| 14 | B66 | 49 |  |
| 15 | C06 | 251 | PASS |
| 16 | C16 | 255 | PASS |
| 17 | C26 | 249 | PASS |
| 18 | C36 | 265 | PASS |
| 19 | C46 | 276 | PASS |
| 20 | C56 | 266 | PASS |
| 21 | C66 | 189 |  |

1. 幅频校准



1. 结论：

检波器已按照《石油地震检波器校准规范》校准，校准结果满足检波器的计量特性要求。