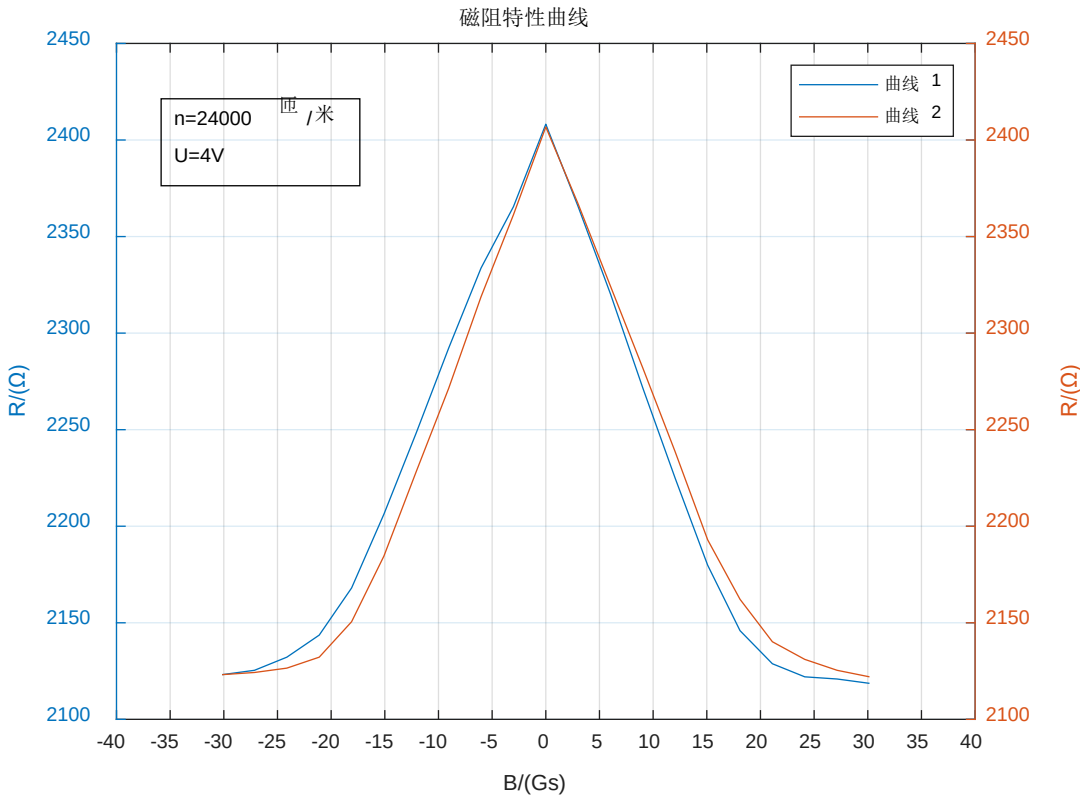
【数据测量与结果分析】（数据处理 Excel，绘图 matlab）

1.磁阻特性曲线（R-B 曲线）

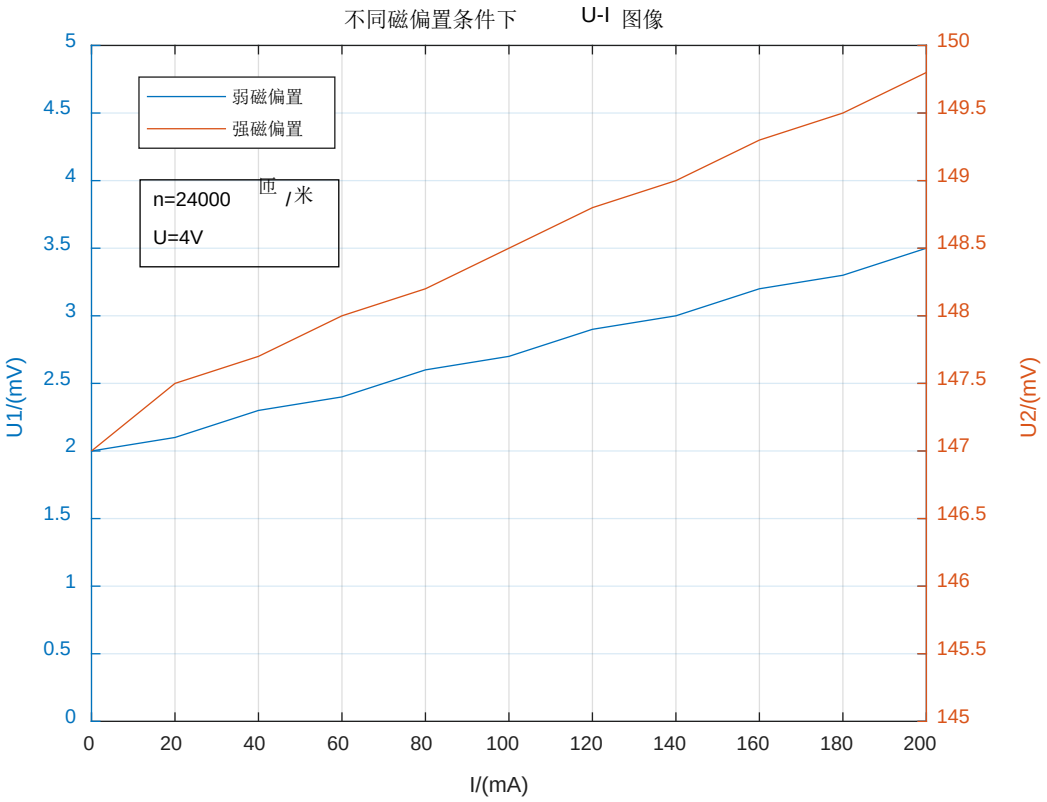
| 监测电流I2(mA) | 磁阻电流I1(mA) | 磁感应强度B(Gs) | 巨磁电阻阻值R(Ω) |
|---|---|---|---|
| 100.0 | 1.888 | 30.159 | 2118.644 |
| 90.0 | 1.886 | 27.143 | 2120.891 |
| 80.0 | 1.885 | 24.127 | 2122.016 |
| 70.0 | 1.879 | 21.112 | 2128.792 |
| 60.0 | 1.864 | 18.096 | 2145.923 |
| 50.0 | 1.835 | 15.080 | 2179.837 |
| 40.0 | 1.798 | 12.064 | 2224.694 |
| 30.0 | 1.761 | 9.048 | 2271.437 |
| 20.0 | 1.724 | 6.032 | 2320.186 |
| 10.0 | 1.691 | 3.016 | 2365.464 |
| 0.0 | 1.661 | 0.000 | 2408.188 |
| -10.0 | 1.691 | -3.016 | 2365.464 |
| -20.0 | 1.714 | -6.032 | 2333.722 |
| -30.0 | 1.745 | -9.048 | 2292.264 |
| -40.0 | 1.779 | -12.064 | 2248.454 |
| -50.0 | 1.813 | -15.080 | 2206.288 |
| -60.0 | 1.845 | -18.096 | 2168.022 |
| -70.0 | 1.866 | -21.112 | 2143.623 |
| -80.0 | 1.876 | -24.127 | 2132.196 |
| -90.0 | 1.882 | -27.143 | 2125.399 |
| -100.0 | 1.884 | -30.159 | 2123.142 |
| -90.0 | 1.883 | -27.143 | 2124.270 |
| -80.0 | 1.881 | -24.127 | 2126.528 |
| -70.0 | 1.876 | -21.112 | 2132.196 |
| -60.0 | 1.860 | -18.096 | 2150.538 |
| -50.0 | 1.831 | -15.080 | 2184.599 |
| -40.0 | 1.795 | -12.064 | 2228.412 |
| -30.0 | 1.761 | -9.048 | 2271.437 |
| -20.0 | 1.725 | -6.032 | 2318.841 |
| -10.0 | 1.694 | -3.016 | 2361.275 |
| 0.0 | 1.662 | 0.000 | 2406.739 |
| 10.0 | 1.690 | 3.016 | 2366.864 |
| 20.0 | 1.721 | 6.032 | 2324.230 |
| 30.0 | 1.753 | 9.048 | 2281.803 |
| 40.0 | 1.787 | 12.064 | 2238.388 |
| 50.0 | 1.824 | 15.080 | 2192.982 |
| 60.0 | 1.850 | 18.096 | 2162.162 |
| 70.0 | 1.869 | 21.112 | 2140.182 |
| 80.0 | 1.877 | 24.127 | 2131.060 |
| 90.0 | 1.882 | 27.143 | 2125.399 |
| 100.0 | 1.885 | 30.159 | 2122.016 |

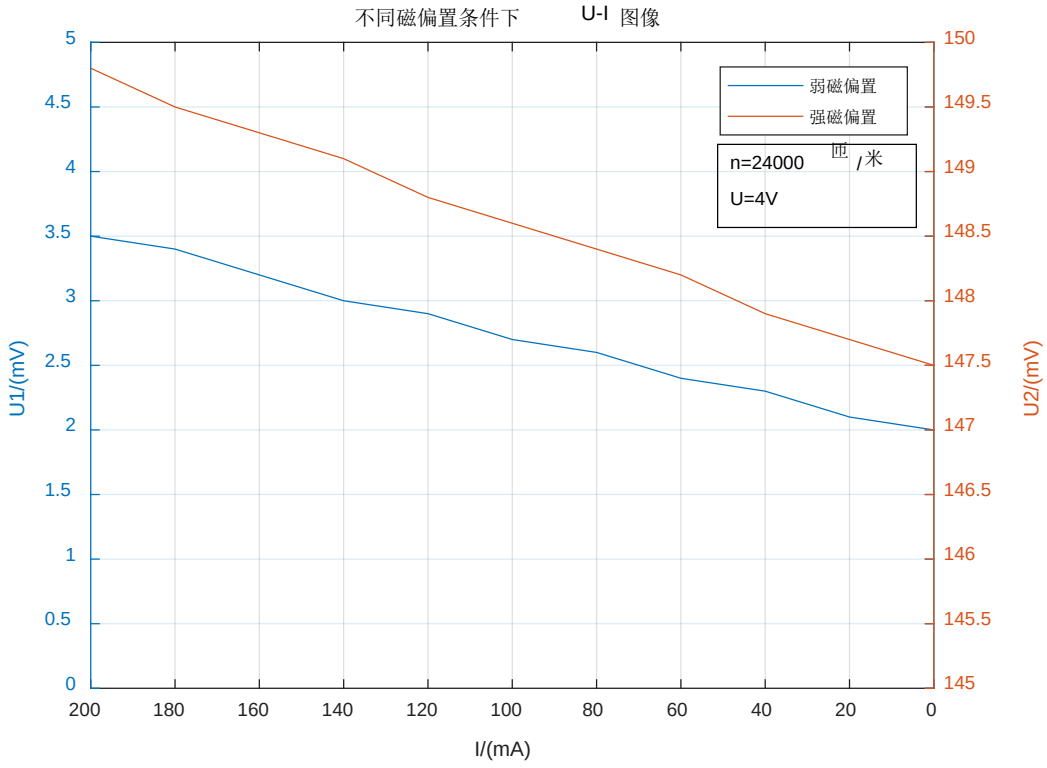



近似线性变化区间：

2.不同磁偏置巨磁阻器件的测量灵敏度

| 弱磁偏置下通过长直导线的电流 I(mA) | 弱磁偏置下GMR两端电压 U(mV) | 强磁偏置下GMR两端电压 U(mV) |
|---|---|---|
| 0.0 | 2.0 | 147.0 |
| 20.0 | 2.1 | 147.5 |
| 40.0 | 2.3 | 147.7 |
| 60.0 | 2.4 | 148.0 |
| 80.0 | 2.6 | 148.2 |
| 100.0 | 2.7 | 148.5 |
| 120.0 | 2.9 | 148.8 |
| 140.0 | 3.0 | 149.0 |
| 160.0 | 3.2 | 149.3 |
| 180.0 | 3.3 | 149.5 |
| 200.0 | 3.5 | 149.8 |
| 180.0 | 3.4 | 149.5 |
| 160.0 | 3.2 | 149.3 |
| 140.0 | 3.0 | 149.1 |
| 120.0 | 2.9 | 148.8 |
| 100.0 | 2.7 | 148.6 |
| 80.0 | 2.6 | 148.4 |
| 60.0 | 2.4 | 148.2 |
| 40.0 | 2.3 | 147.9 |
| 20.0 | 2.1 | 147.7 |
| 0.0 | 2.0 | 147.5 |




比较不同磁偏置下的测量灵敏度：

【分析讨论题】

1 .试分析不同磁偏置影响电流测量灵敏度的原因是什么？

2 .如何理解磁阻特性变化过程的物理机理？

3. 试讨论梯度传感器的特点，并分析梯度传感器可否用于车辆流量测量