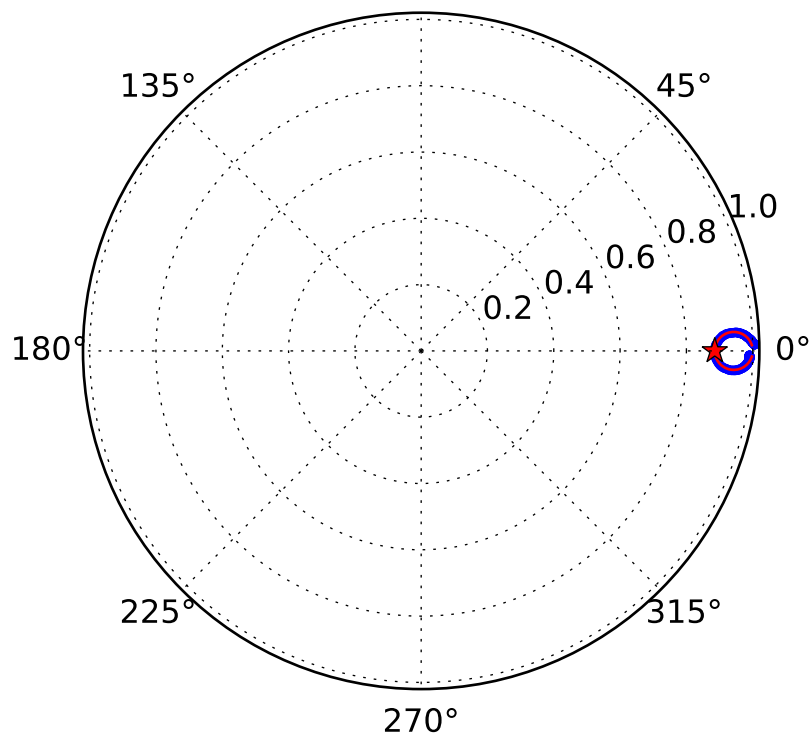
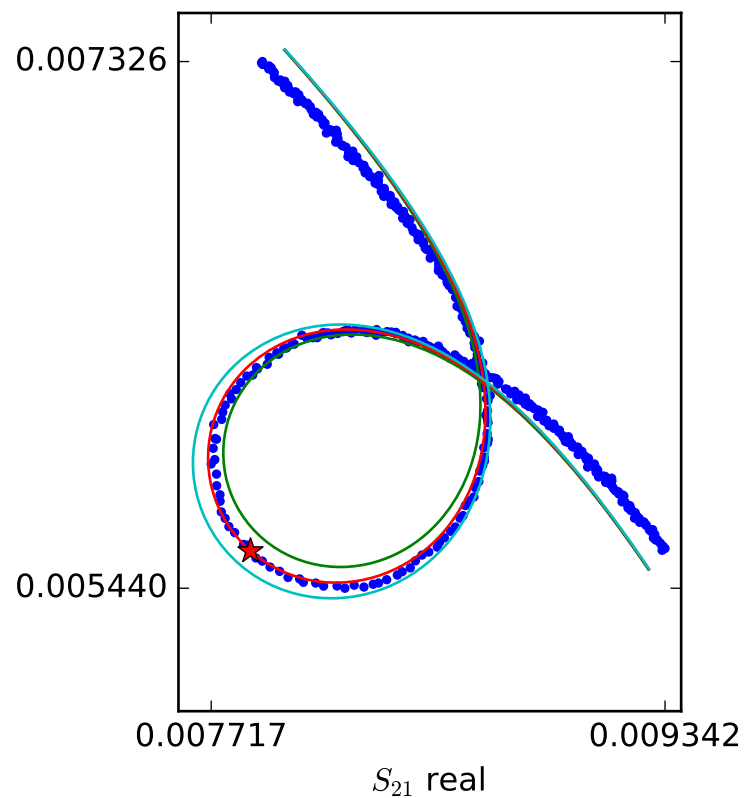
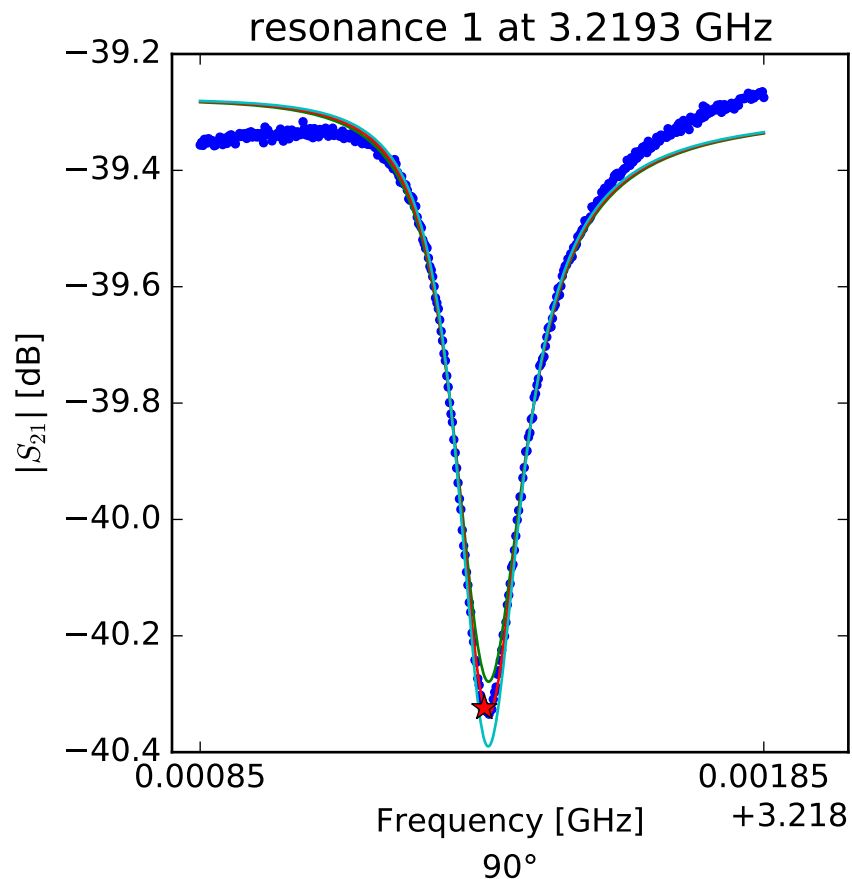


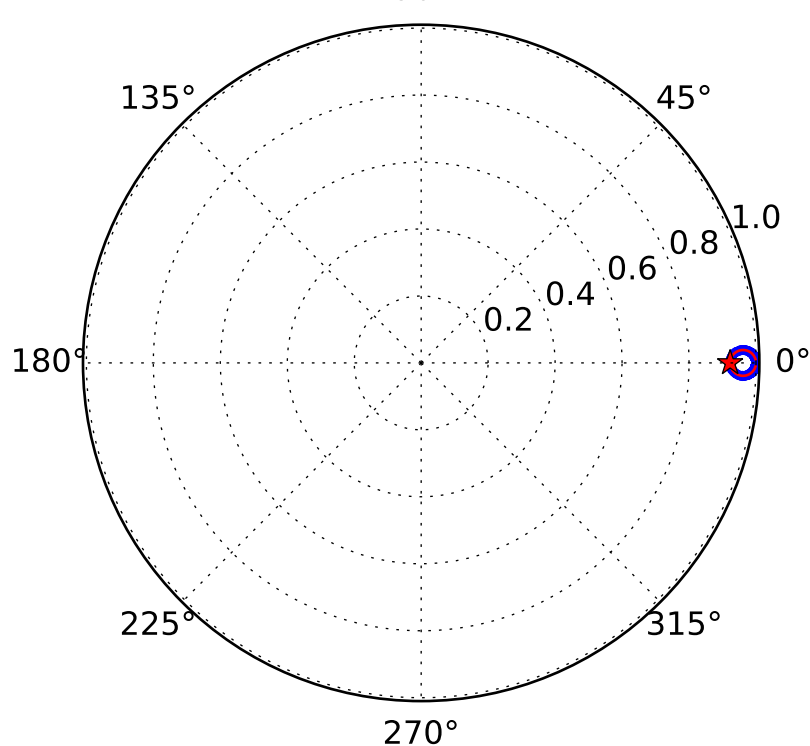
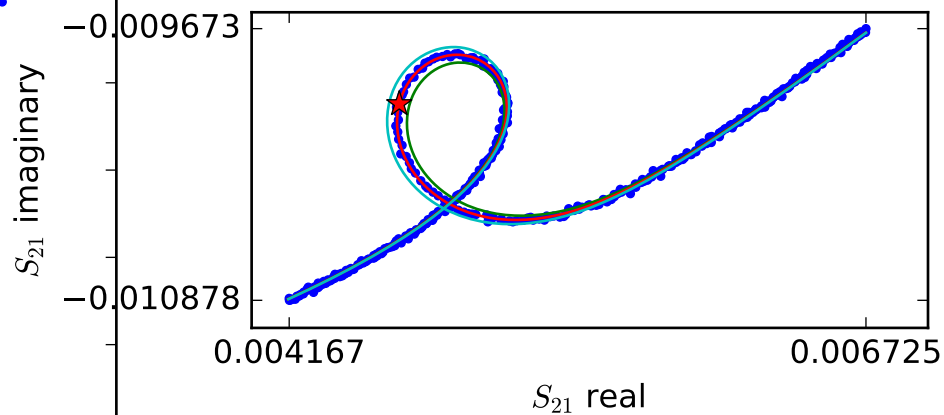
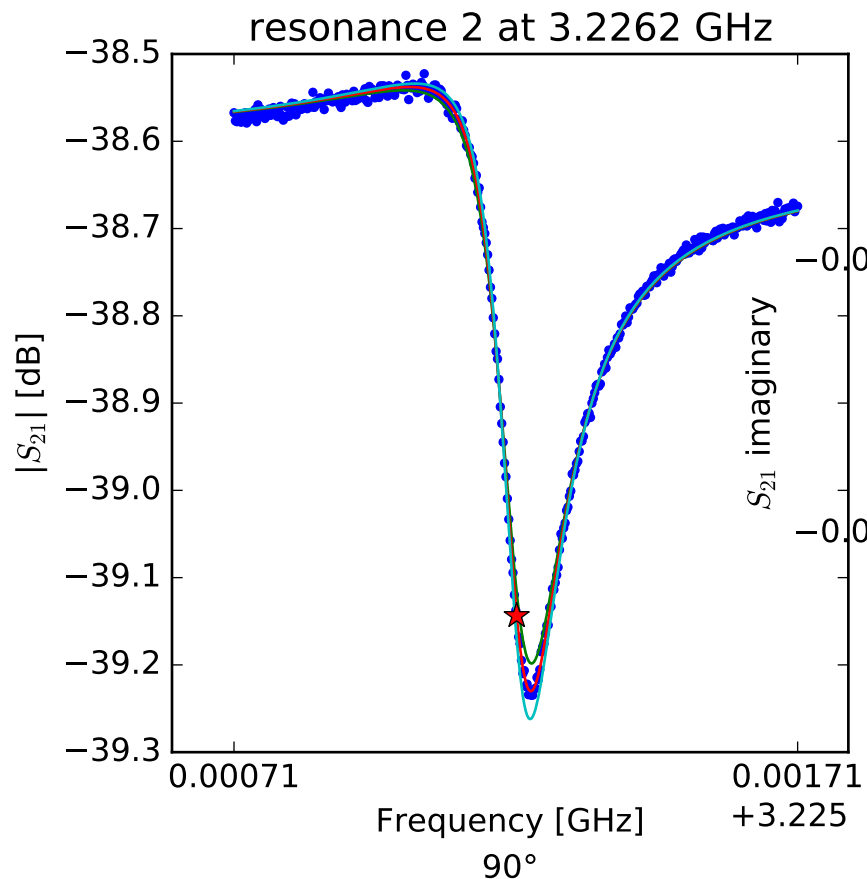
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r(\frac{f-f_r}{f_r})} \right]$$

$$\begin{aligned} f_r &= 3.21558250628 \\ Q_r &= 6305.32919638 \\ Q_c &= 107968.848387 \\ a &= (0.0101891287676 + 0.000618923359283j) \\ \phi_0 &= 1.41212313402 \\ \tau &= 37.2456007427 \end{aligned}$$



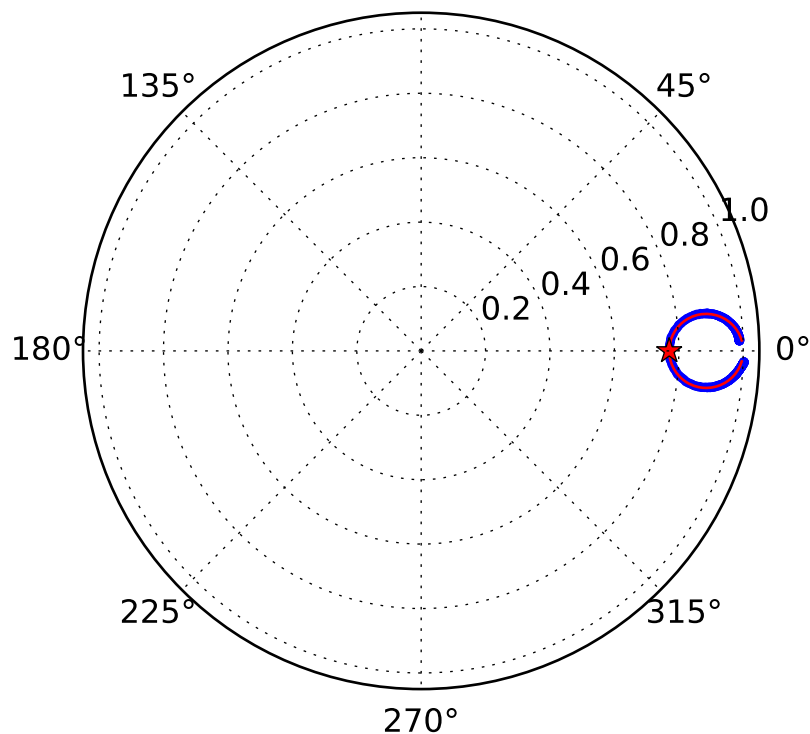
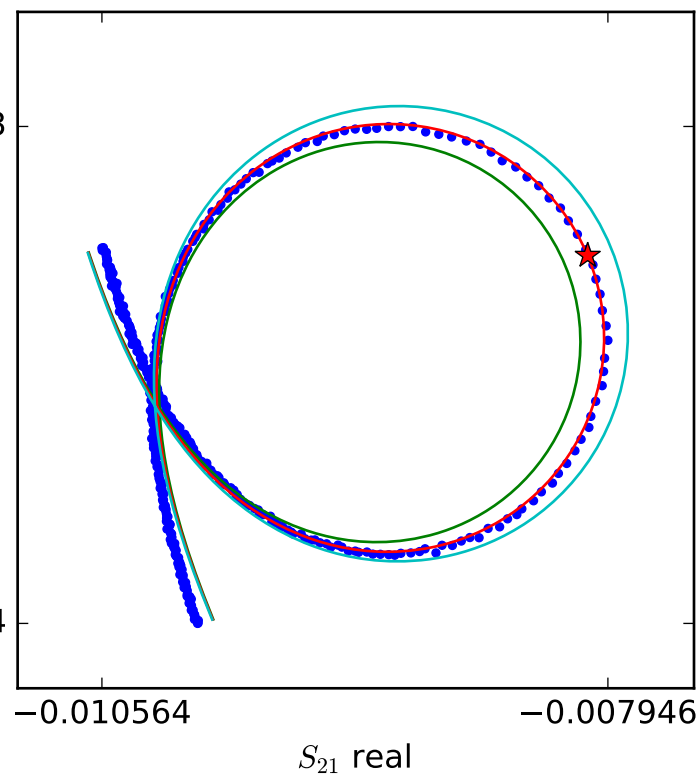
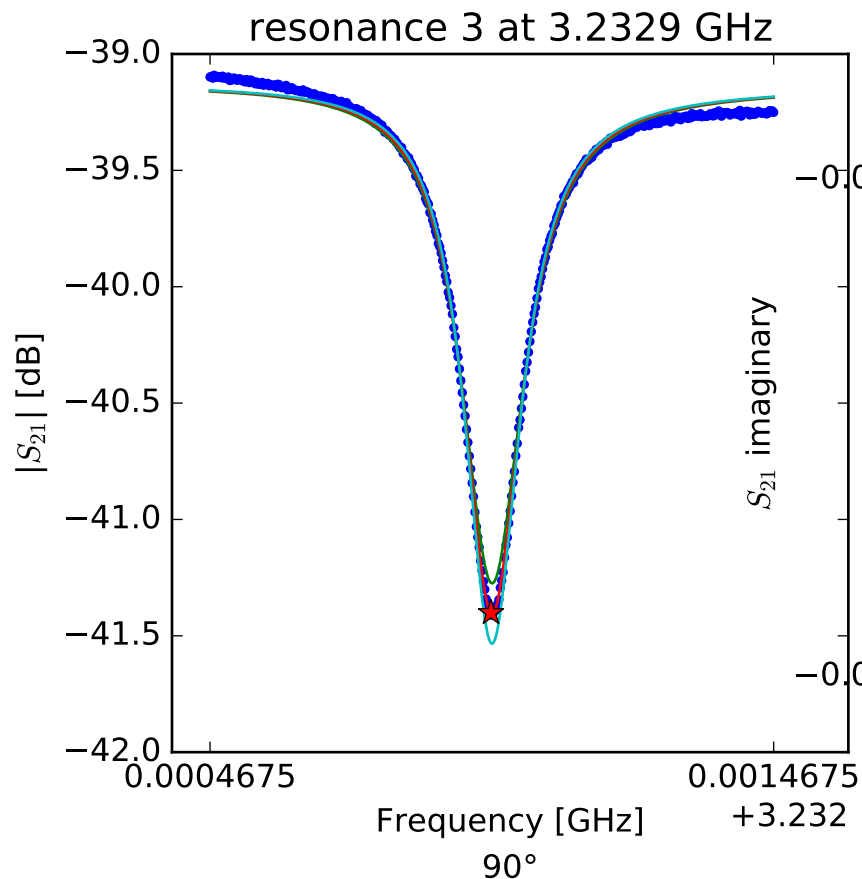
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.21935410222 \\ Q_r &= 21012.4476466 \\ Q_c &= 183412.354004 \\ a &= (0.0102661858987 + 0.00352777902763j) \\ \phi_0 &= 0.178077273162 \\ \tau &= 38.8123968084 \end{aligned}$$



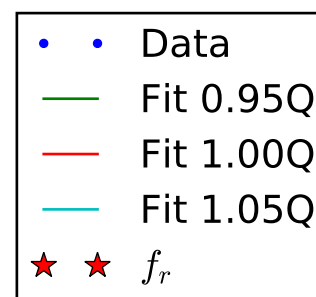
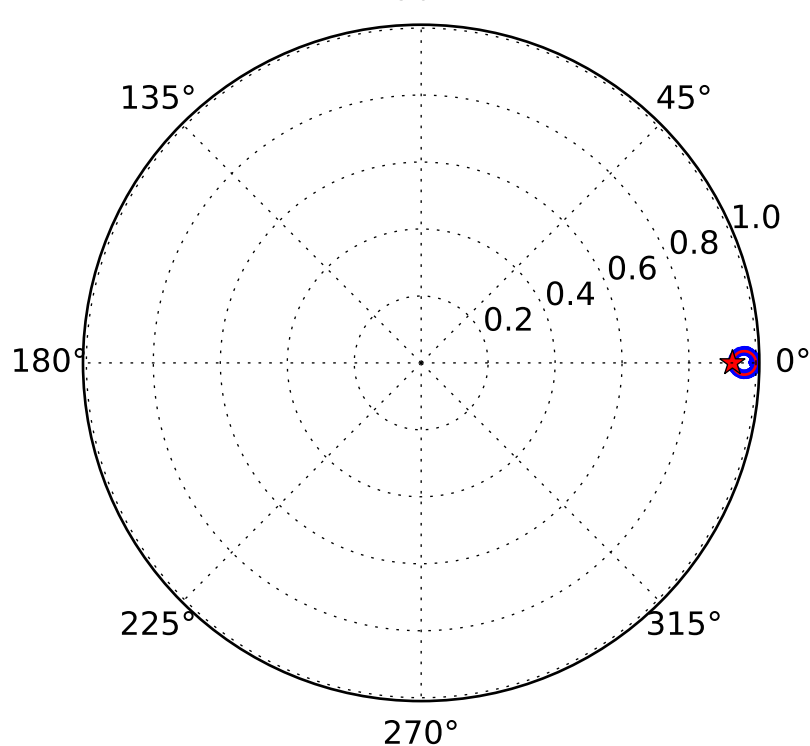
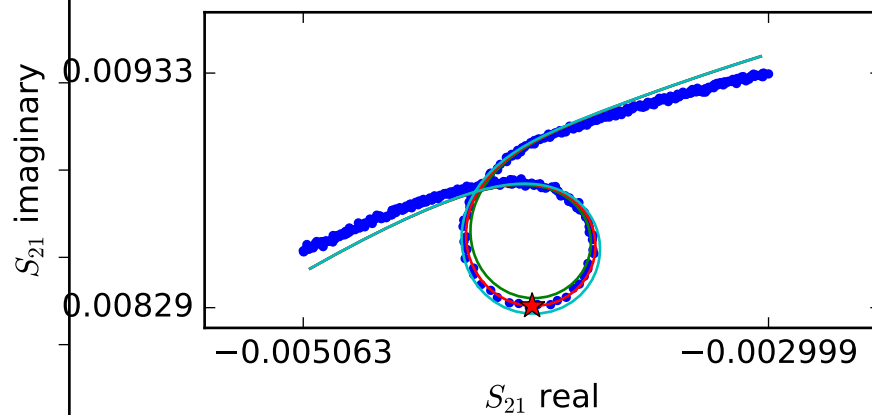
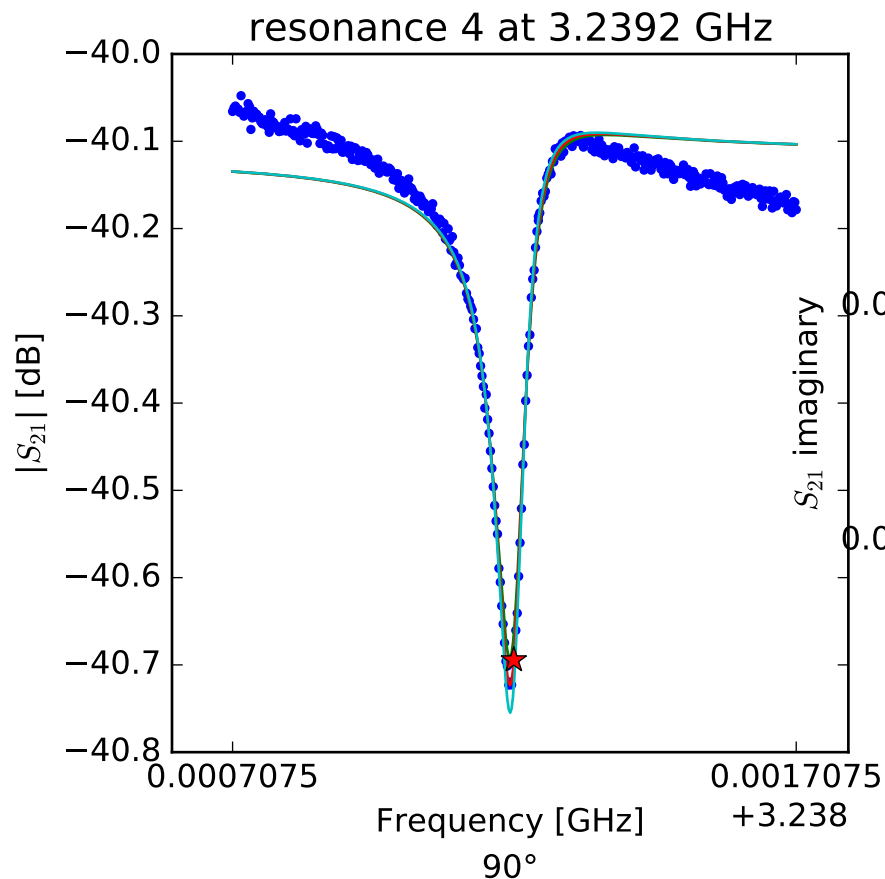
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.22621150513 \\ Q_r &= 23330.9863945 \\ Q_c &= 301830.262375 \\ a &= (0.0117207782319 + 0.000501529982926j) \\ \phi_0 &= 0.671581384878 \\ \tau &= 40.9704595403 \end{aligned}$$



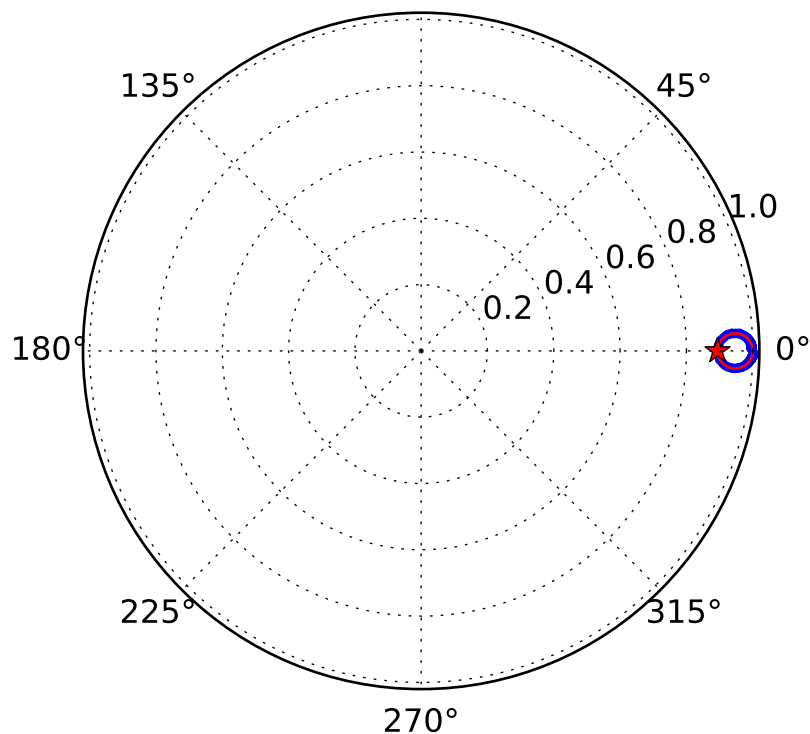
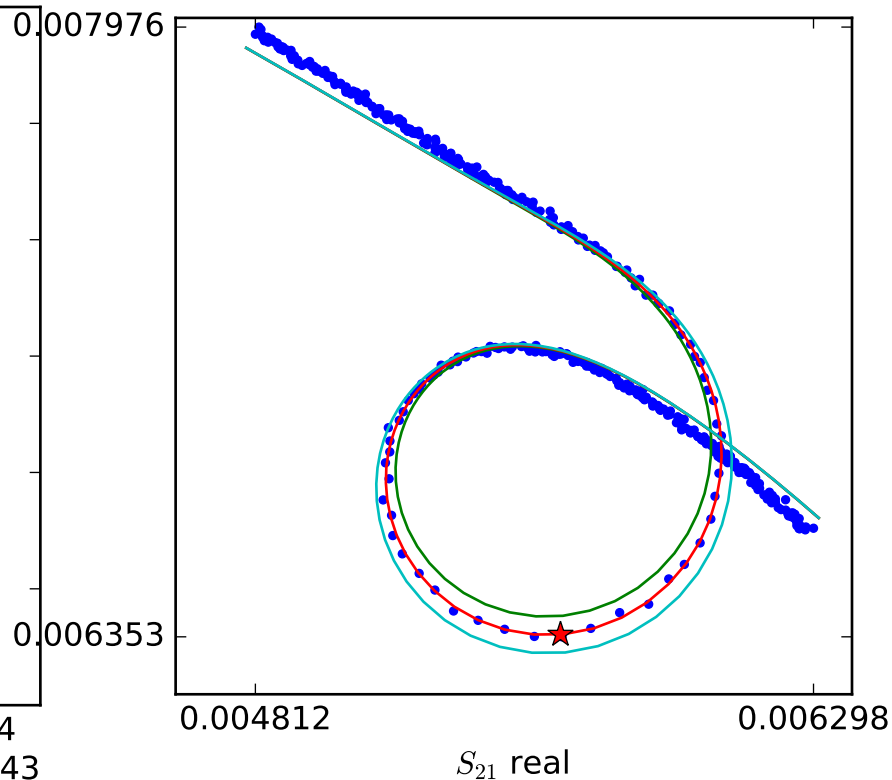
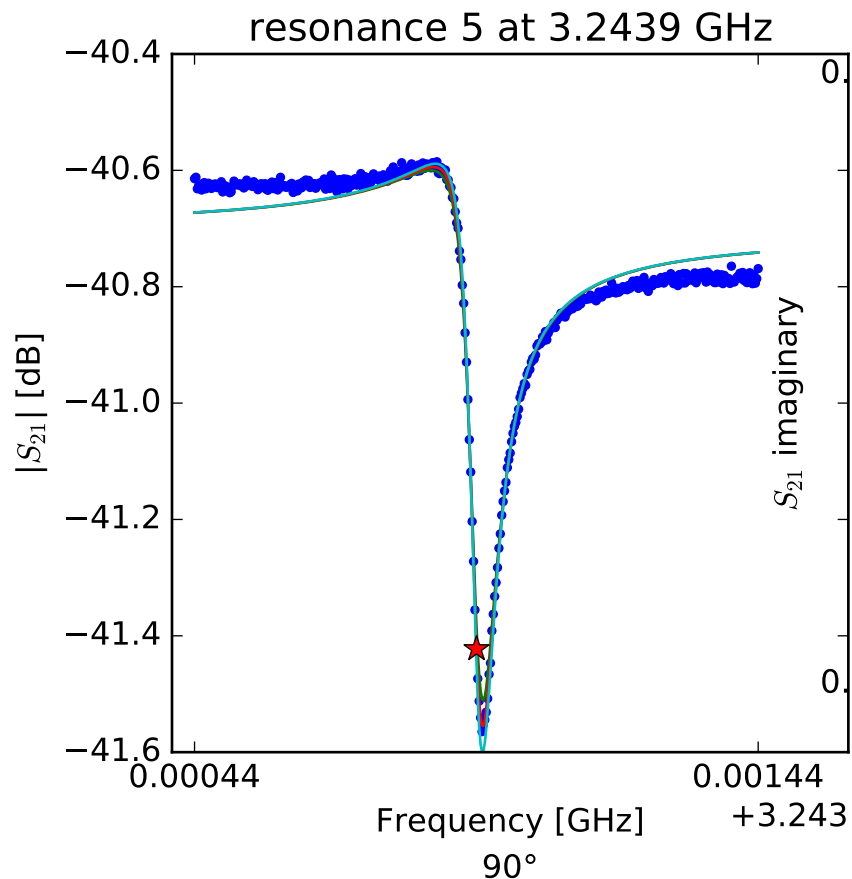
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.23296596139 \\ Q_r &= 22299.7883226 \\ Q_c &= 96985.7737149 \\ a &= (0.0088051563309 + 0.00667030479795j) \\ \phi_0 &= 0.0476988729476 \\ \tau &= 39.452423328 \end{aligned}$$



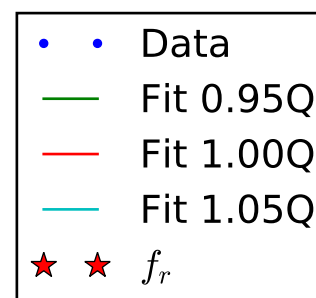
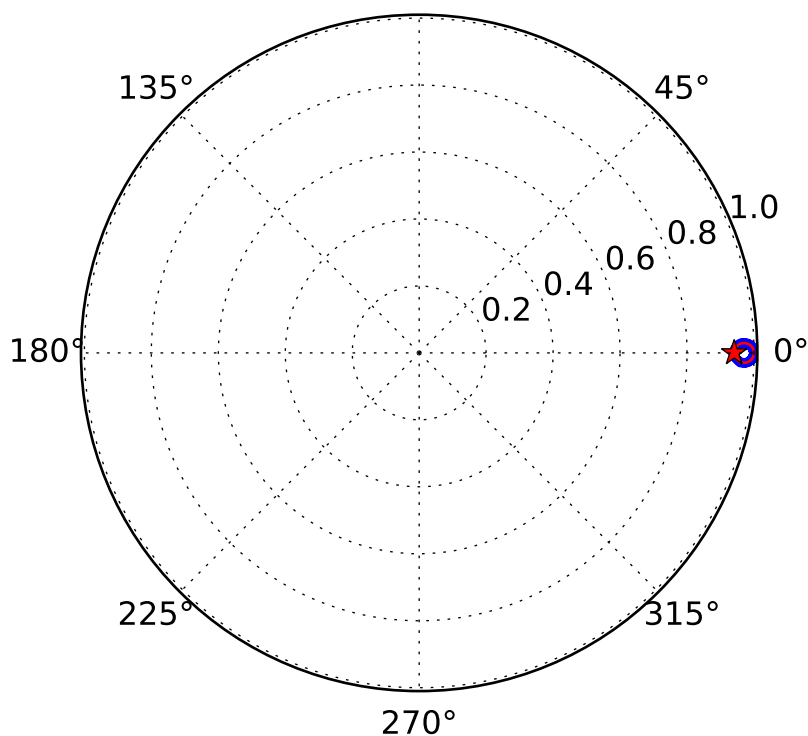
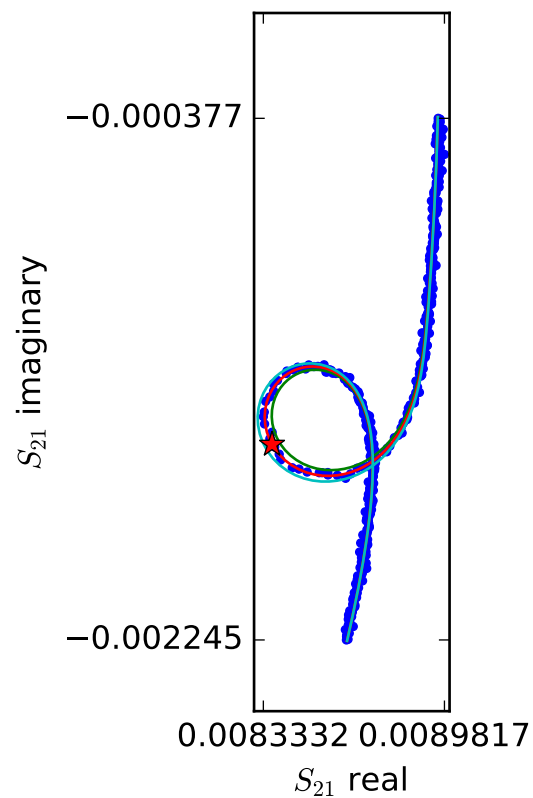
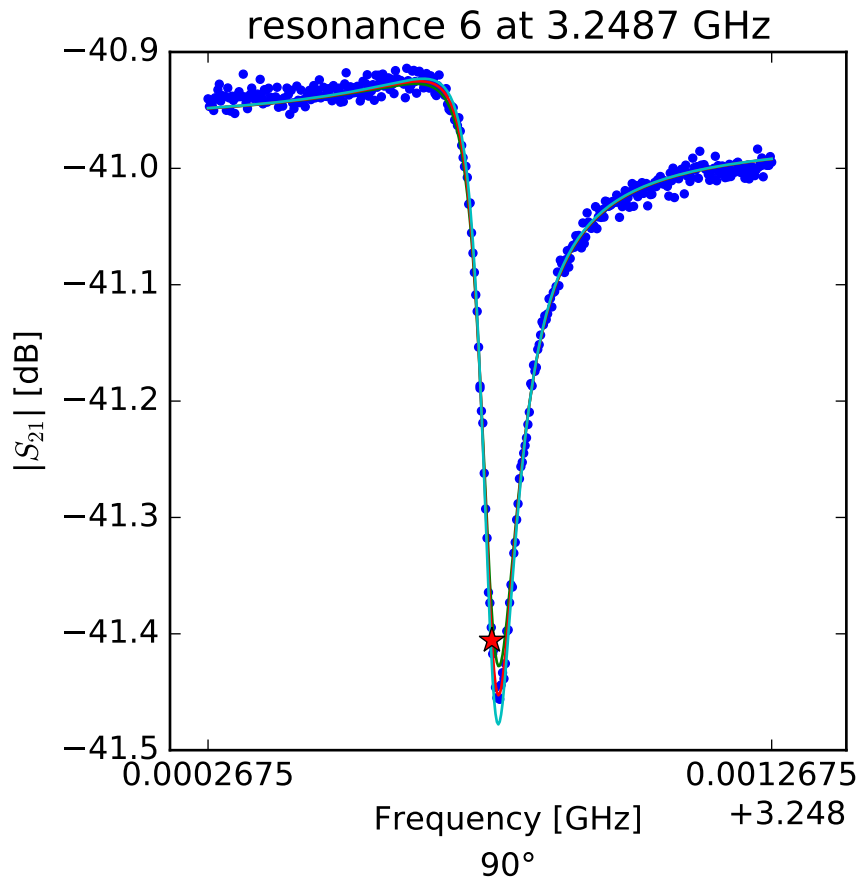
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.23920648051 \\ Q_r &= 49658.4720406 \\ Q_c &= 705584.308909 \\ a &= (-0.00386615529072 + 0.0090775006871j) \\ \phi_0 &= -0.402752027381 \\ \tau &= 37.0450428873 \end{aligned}$$



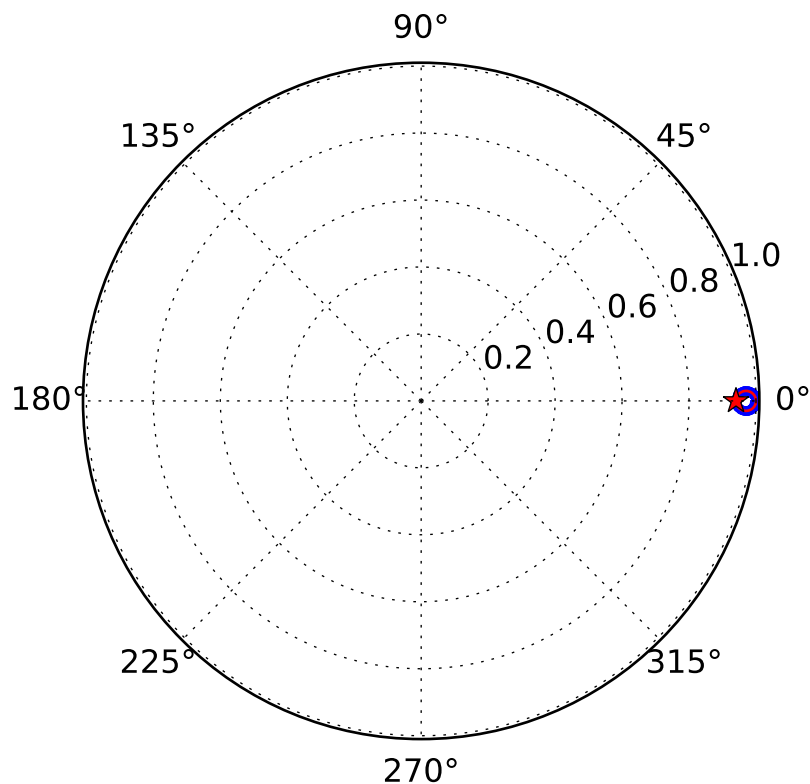
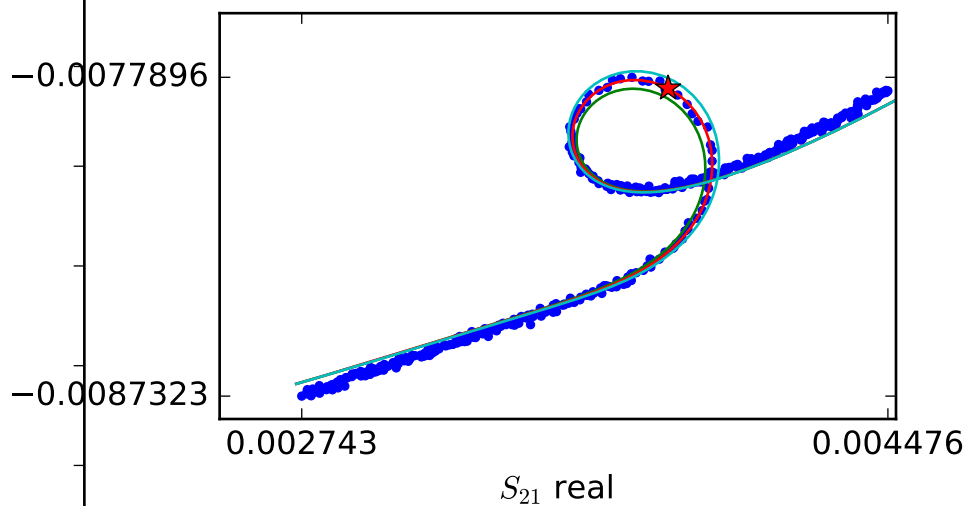
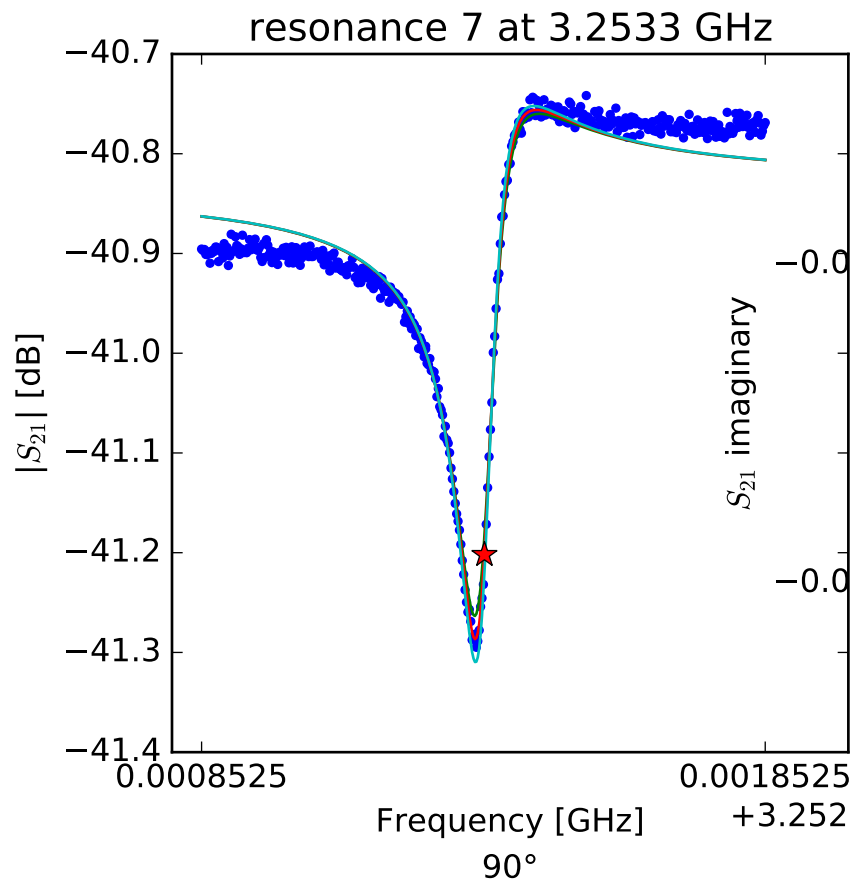
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.24394029787 \\ Q_r &= 55510.1228853 \\ Q_c &= 522950.345111 \\ a &= (-0.00770521388338 - 0.00506528614713j) \\ \phi_0 &= 0.69051221872 \\ \tau &= 35.5882350386 \end{aligned}$$



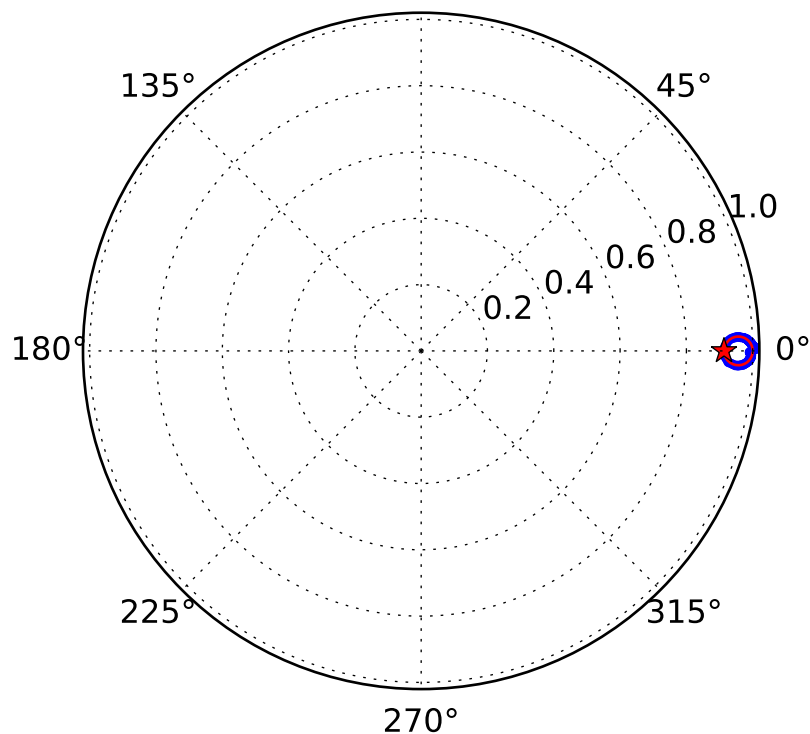
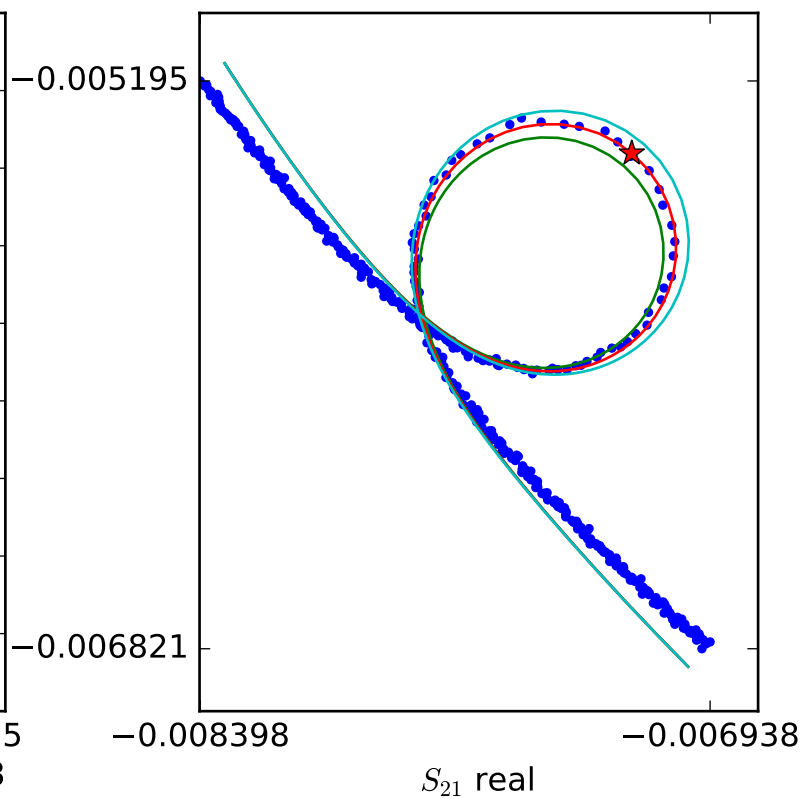
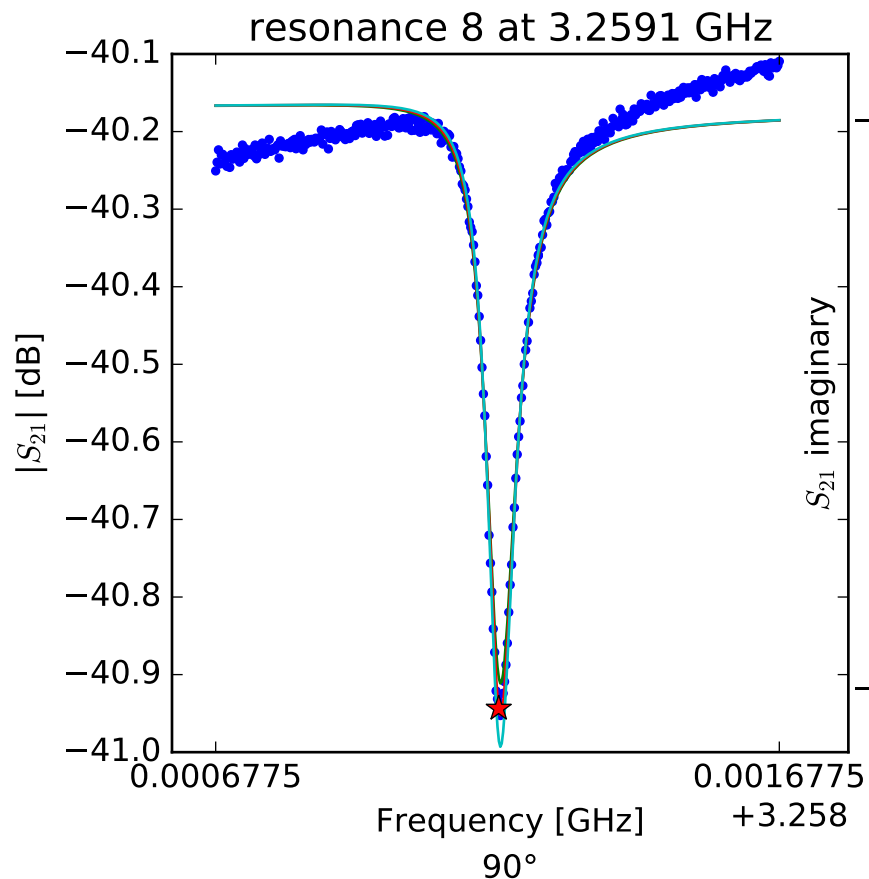
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.2487710553 \\ Q_r &= 41539.8453483 \\ Q_c &= 701166.41077 \\ a &= (0.00357746154792 + 0.00819960111989j) \\ \phi_0 &= 0.573921386701 \\ \tau &= 35.1542799055 \end{aligned}$$



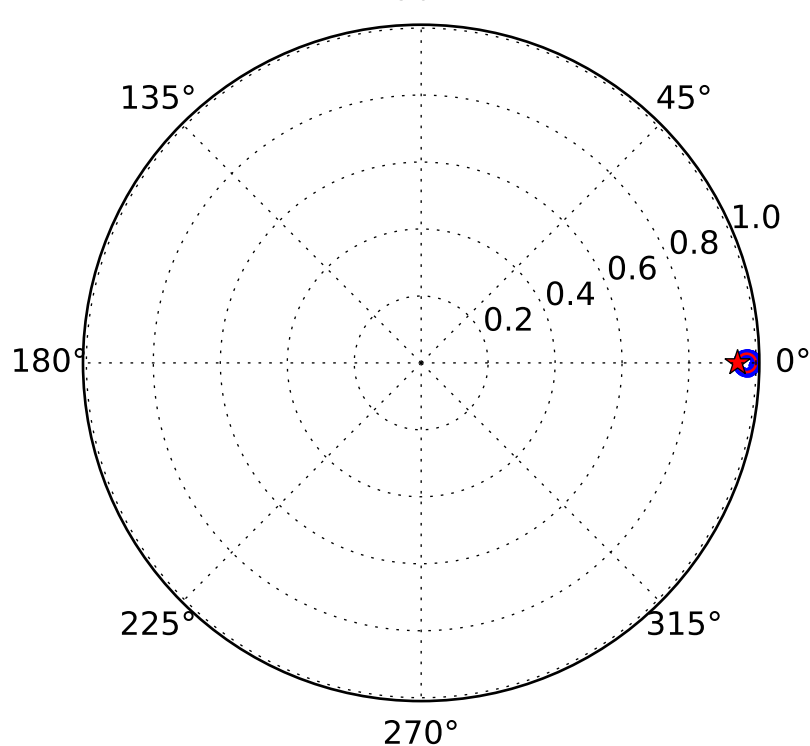
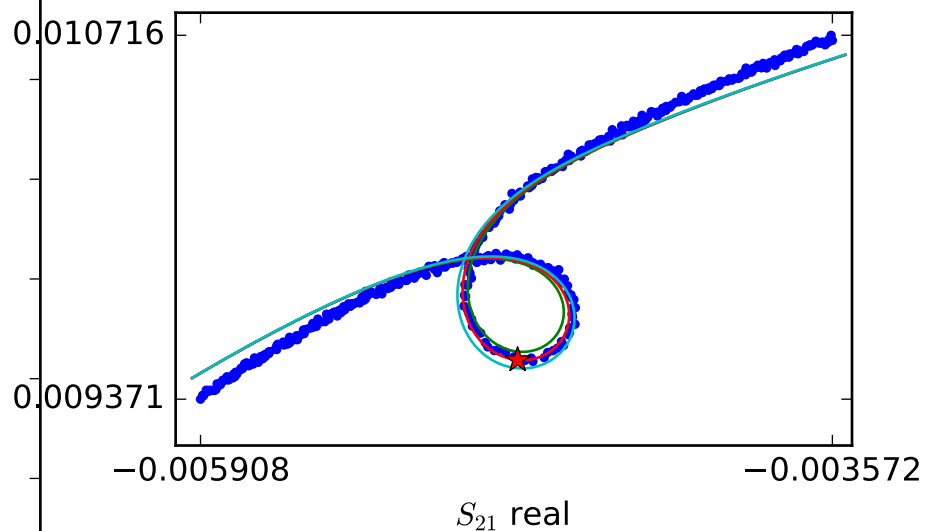
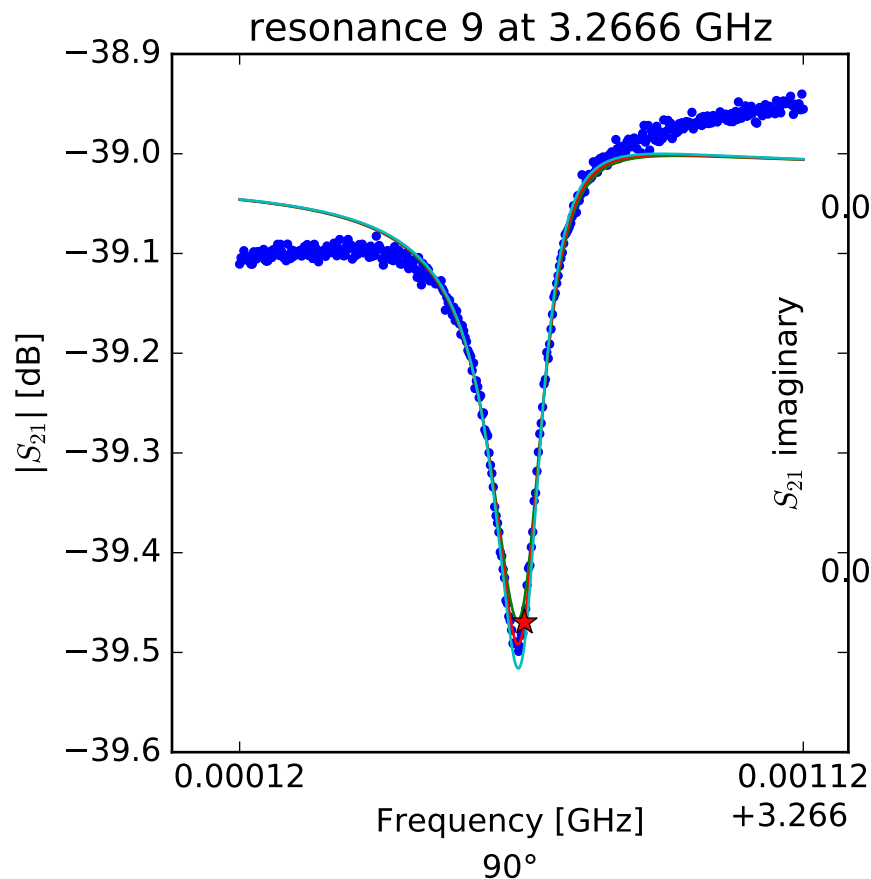
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.25335433809 \\ Q_r &= 41658.779143 \\ Q_c &= 696753.372754 \\ a &= (0.00895500930021 + 0.00153829487762j) \\ \phi_0 &= -0.778226870196 \\ \tau &= 35.4131864257 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.25917963136 \\ Q_r &= 49613.0131631 \\ Q_c &= 572547.160121 \\ a &= (0.00954969851878 - 0.00221357241731j) \\ \phi_0 &= 0.192378484957 \\ \tau &= 37.2357572437 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.26662526411$$

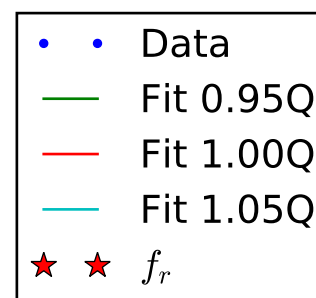
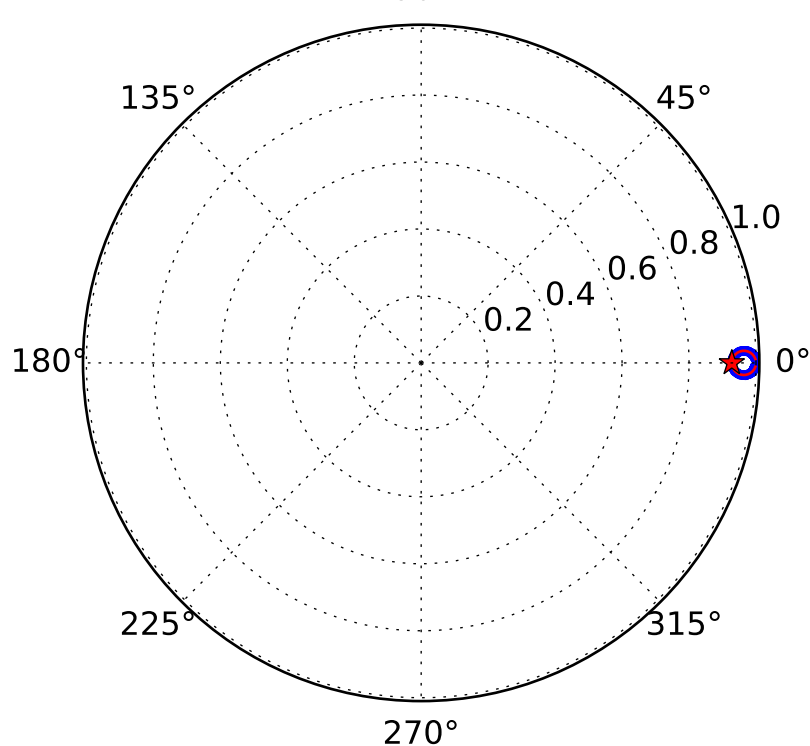
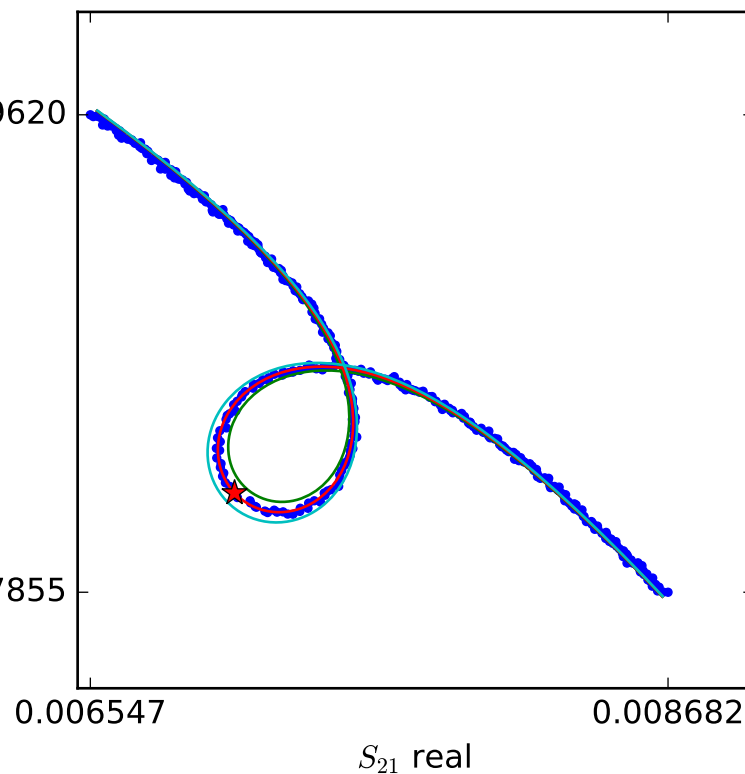
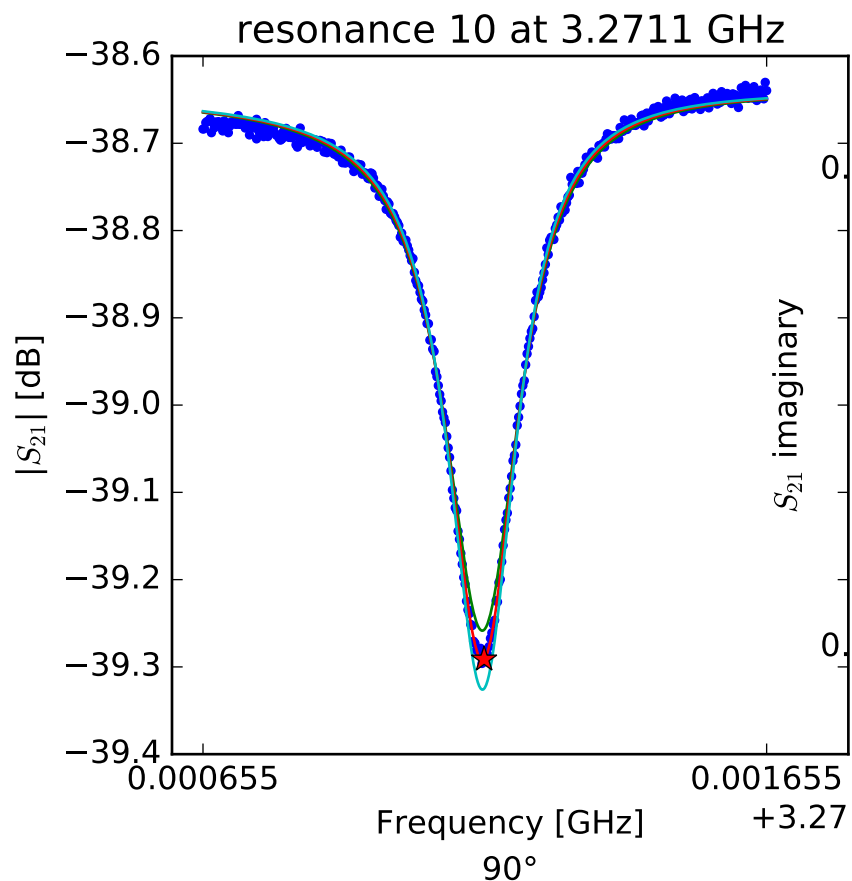
$$Q_r = 30304.870674$$

$$Q_c = 550236.814609$$

$$a = (-0.00930038264502 + 0.00622792460208j)$$

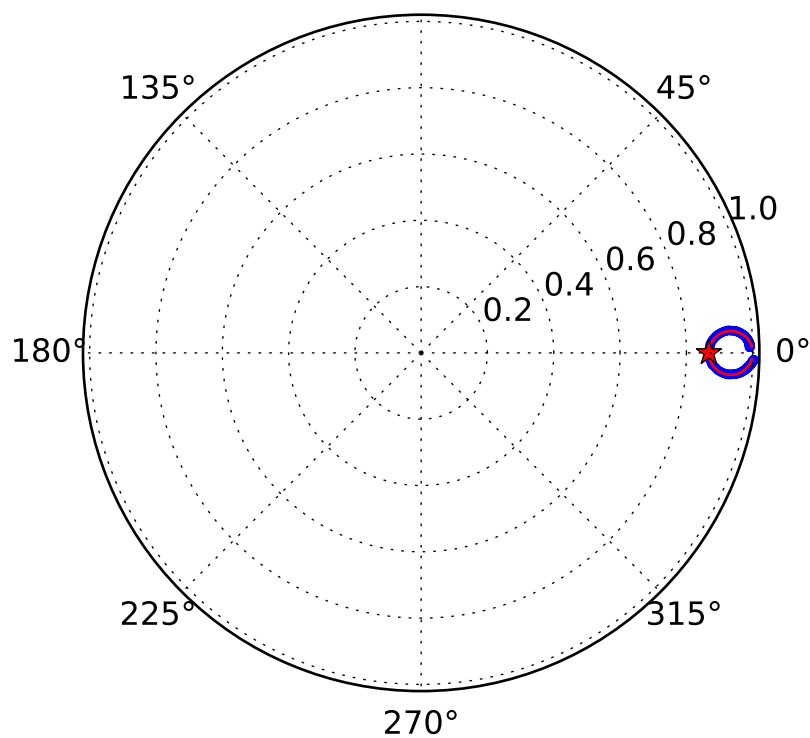
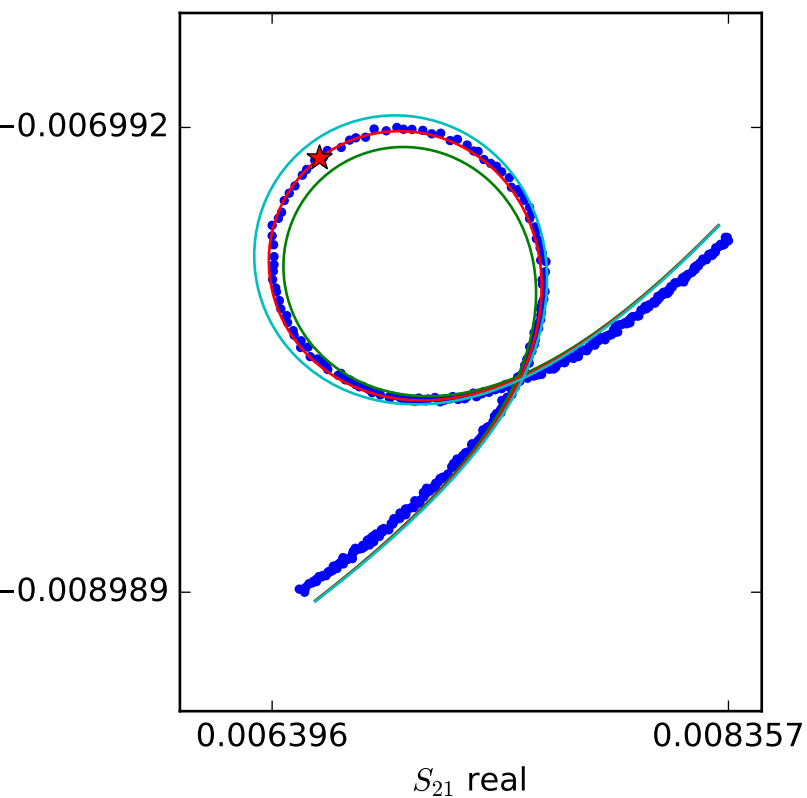
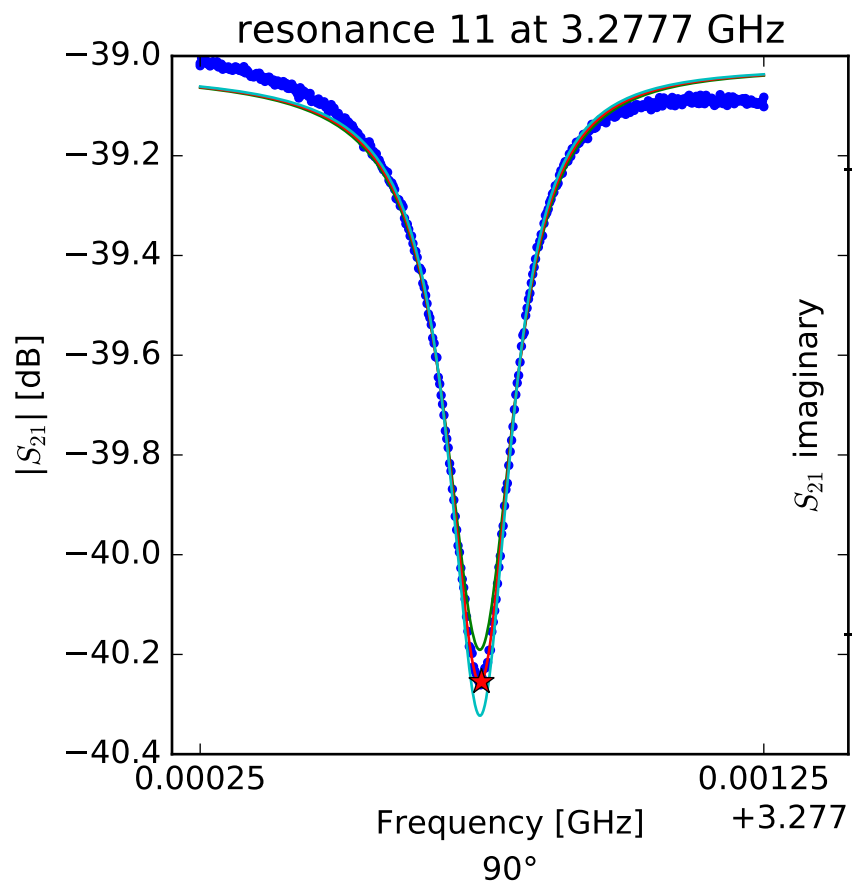
$$\phi_0 = -0.406420345213$$

$$\tau = 40.1289507687$$



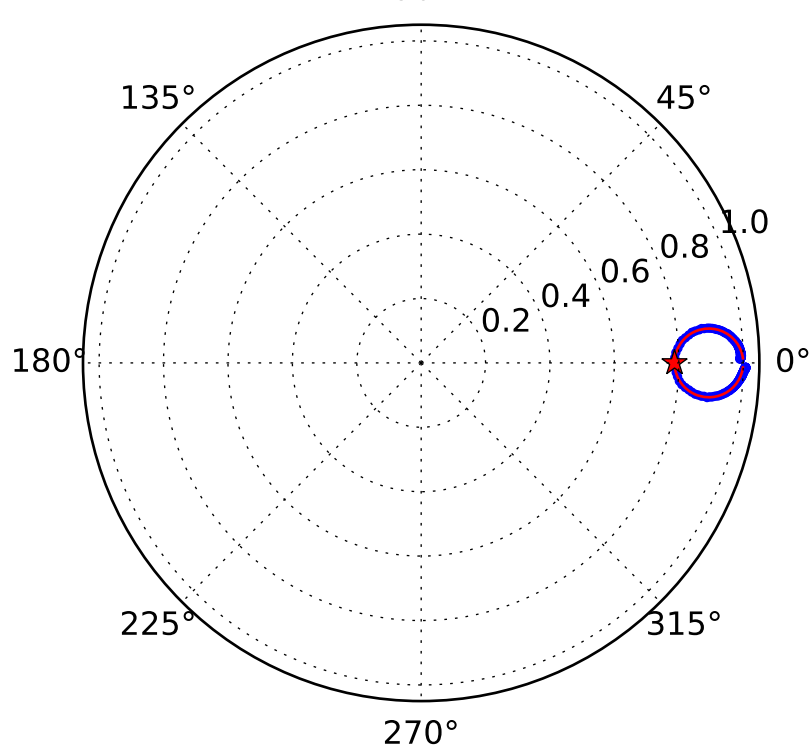
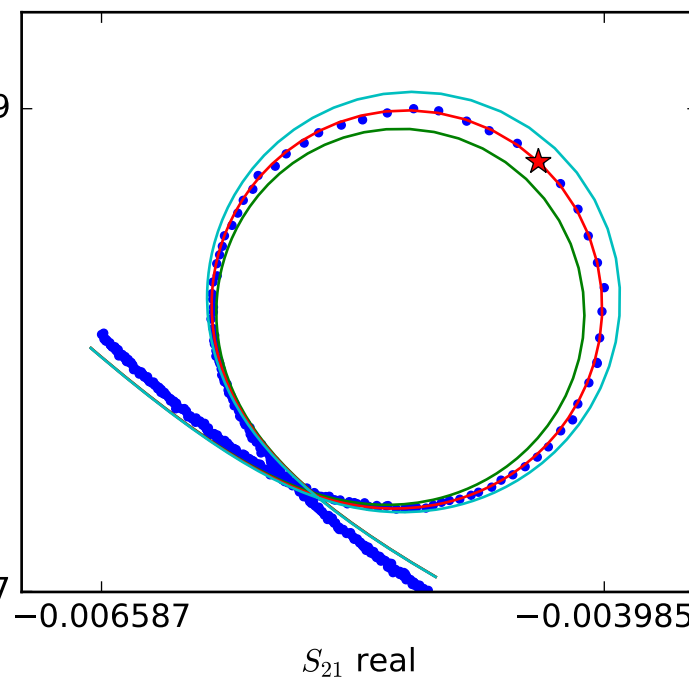
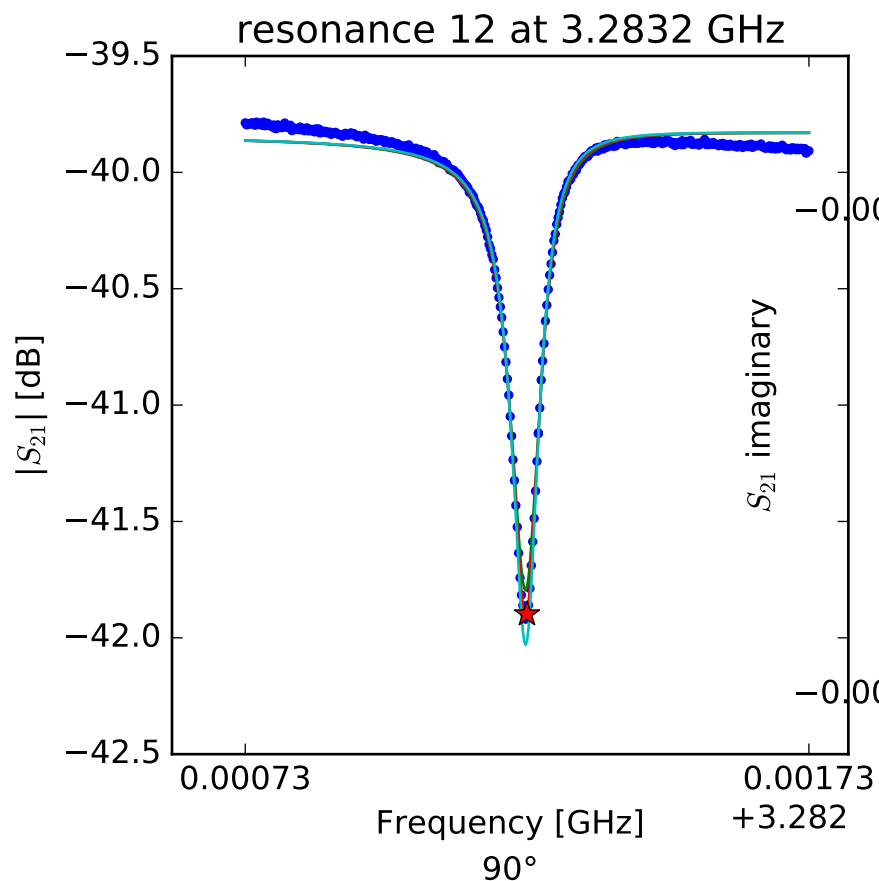
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.2711537772 \\ Q_r &= 20387.1083469 \\ Q_c &= 281970.845908 \\ a &= (0.0107679124576 + 0.00455861724034j) \\ \phi_0 &= -0.0744149258145 \\ \tau &= 41.2477720438 \end{aligned}$$



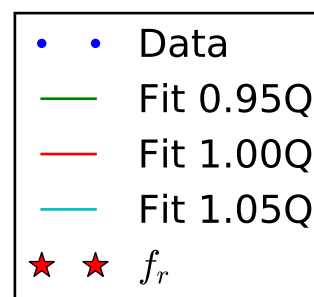
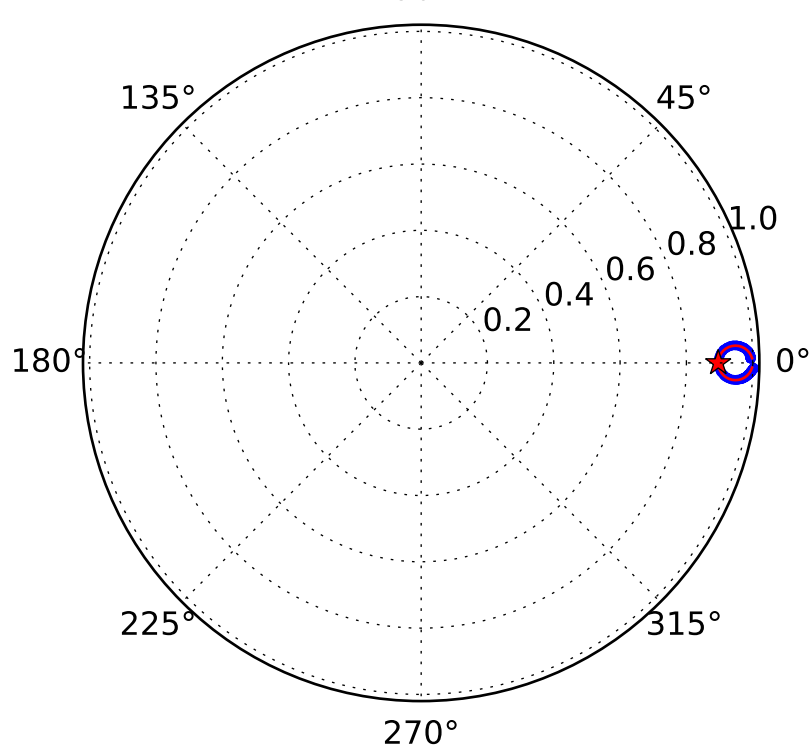
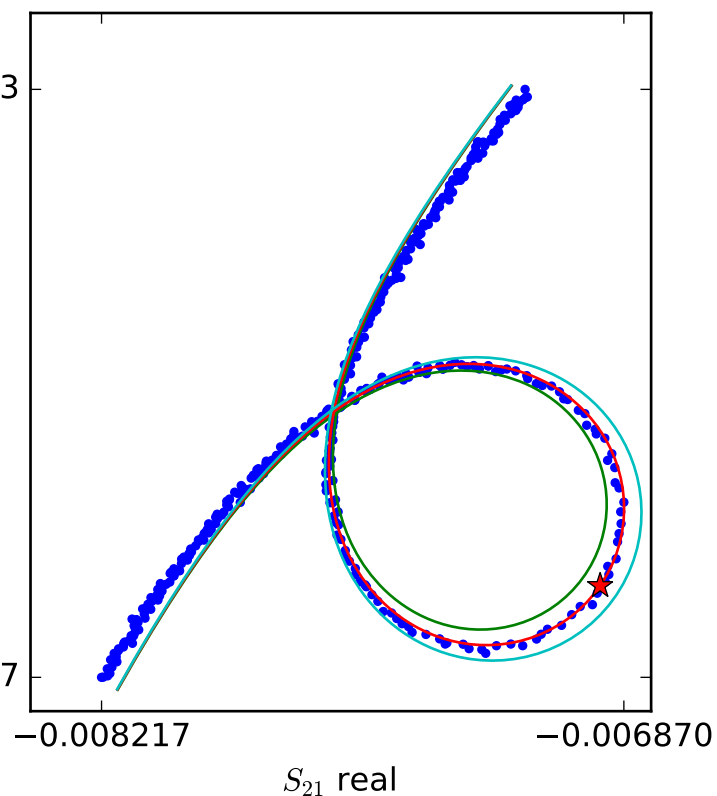
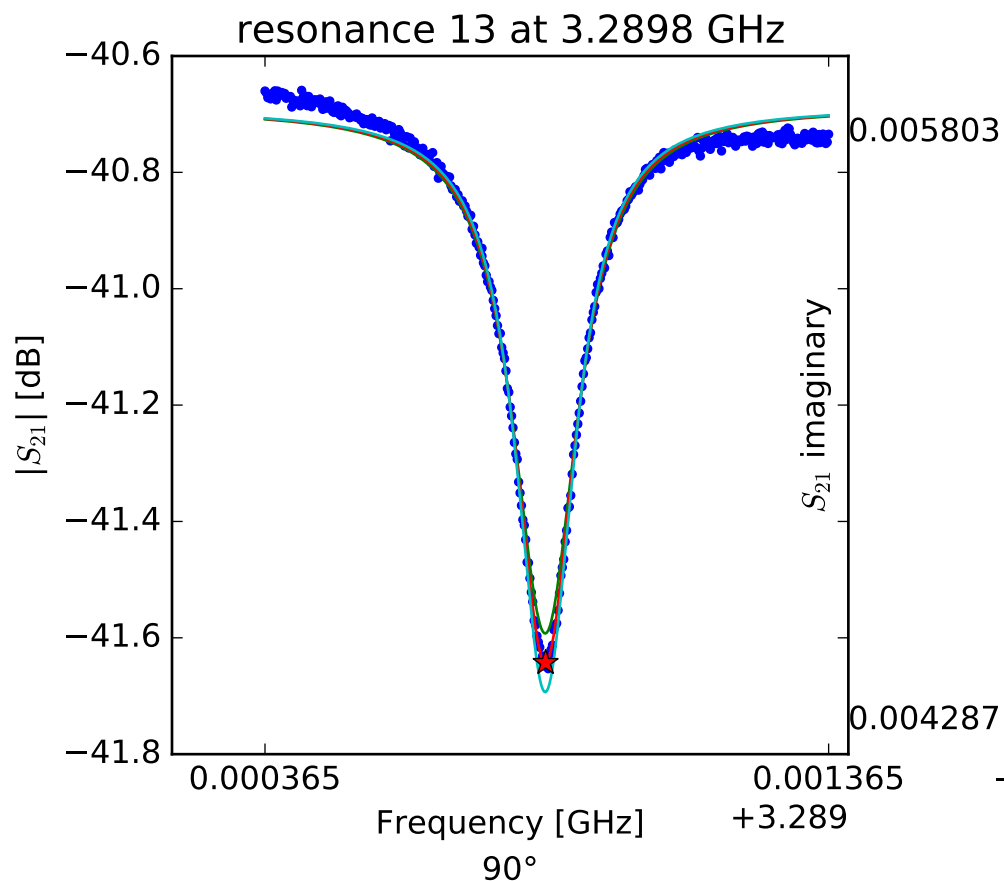
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.27774917424 \\ Q_r &= 21726.1549083 \\ Q_c &= 164248.549479 \\ a &= (0.00711966837674 + 0.00862810249533j) \\ \phi_0 &= -0.0713048517652 \\ \tau &= 40.0497367602 \end{aligned}$$



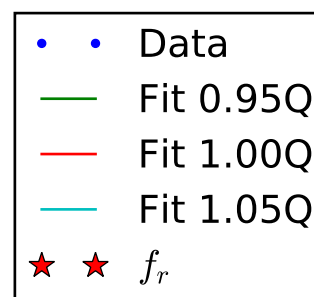
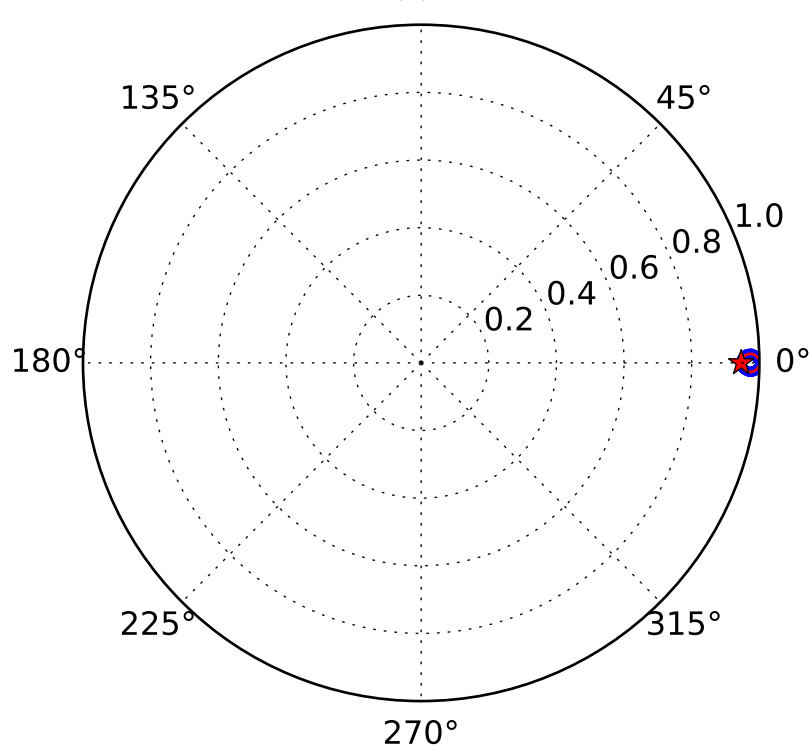
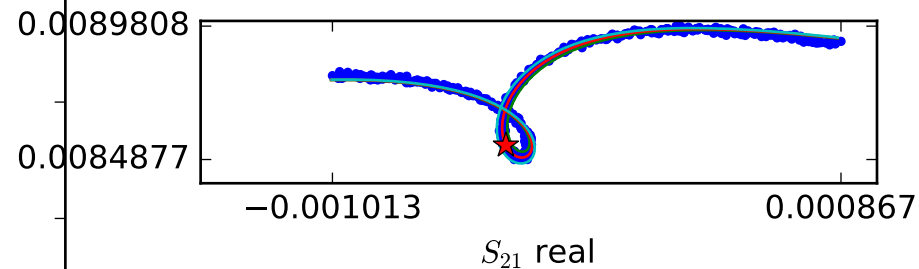
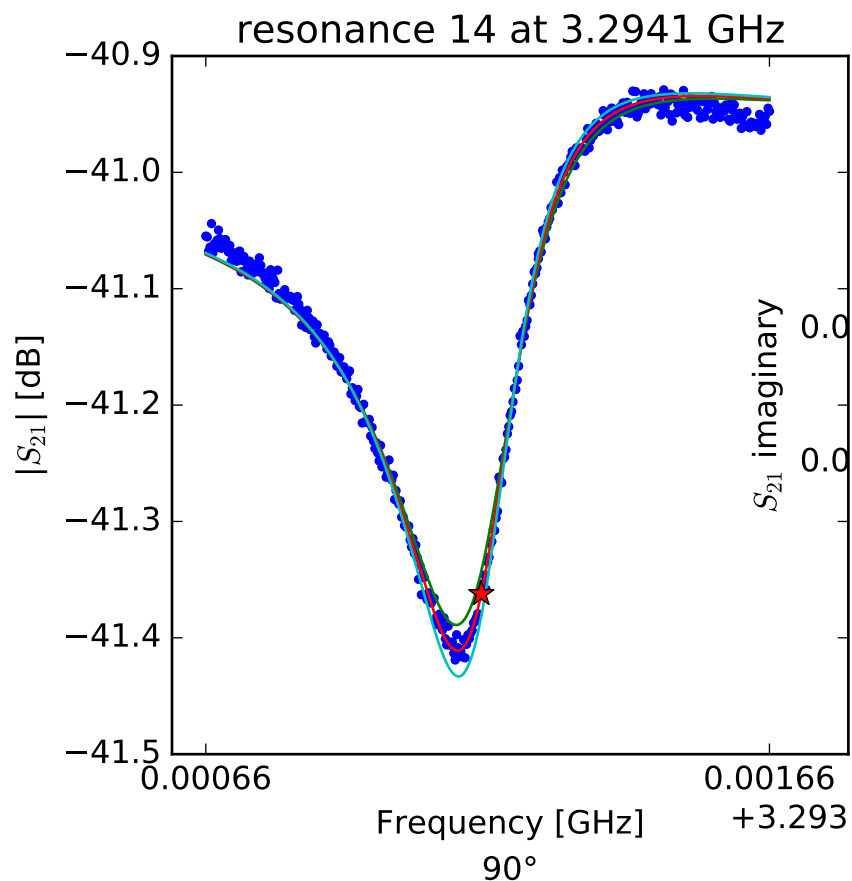
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.28322976431 \\ Q_r &= 48019.8465961 \\ Q_c &= 225000.658956 \\ a &= (0.00476006708966 - 0.00900654203408j) \\ \phi_0 &= -0.132053182697 \\ \tau &= 38.1251142517 \end{aligned}$$



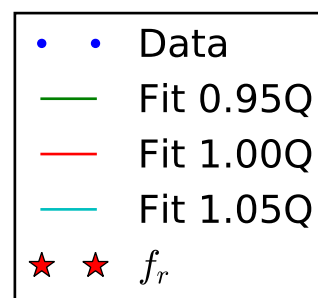
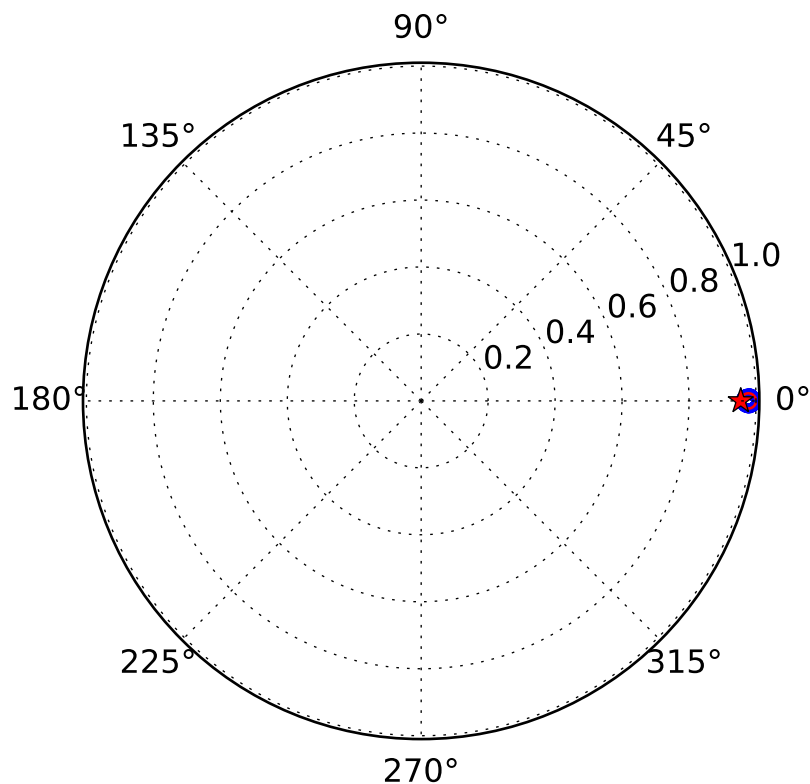
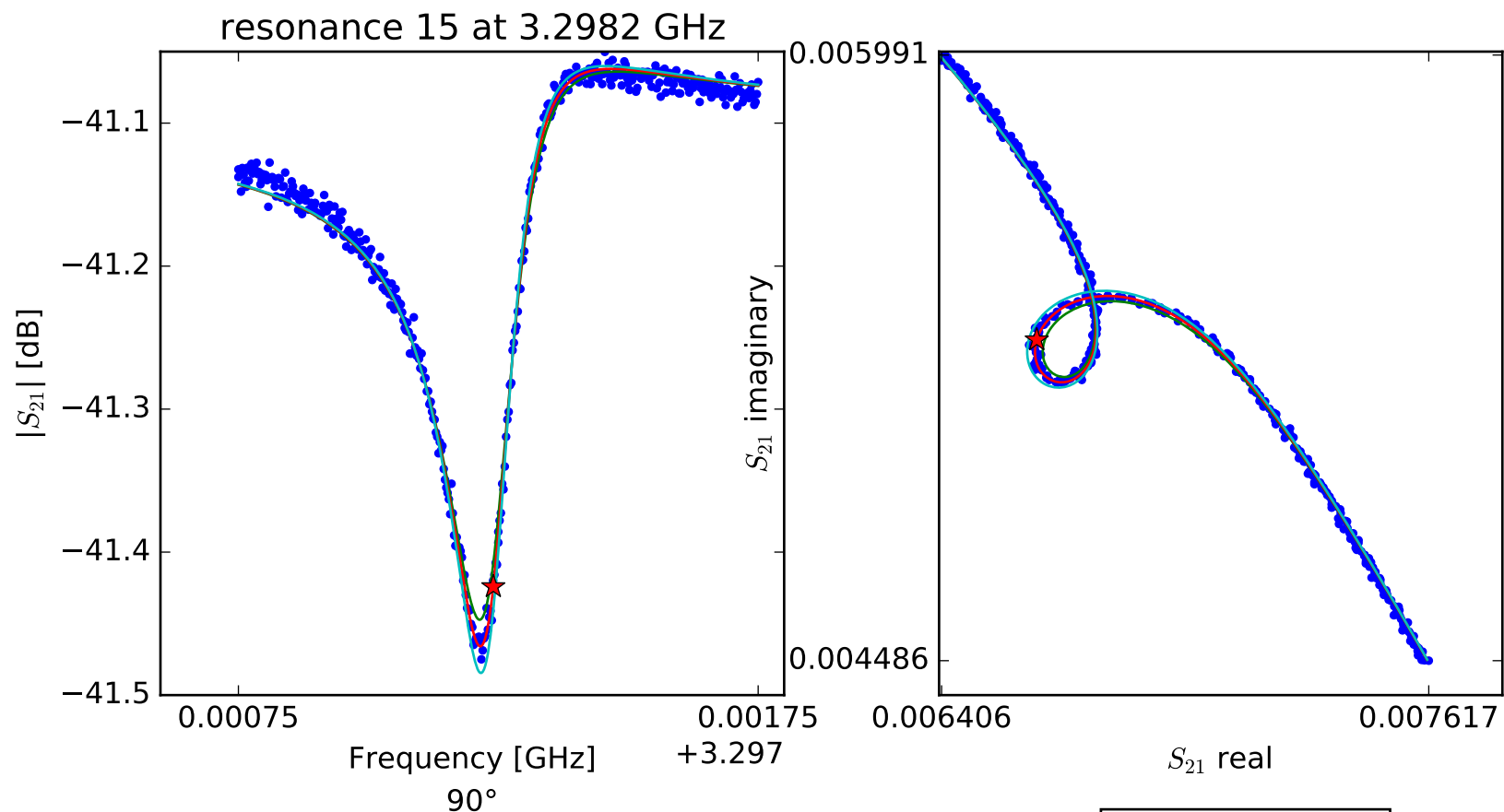
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.28986284766 \\ Q_r &= 23455.1314432 \\ Q_c &= 225454.491953 \\ a &= (0.0055324664874 + 0.00739767320212j) \\ \phi_0 &= -0.0190599319885 \\ \tau &= 36.7006709192 \end{aligned}$$



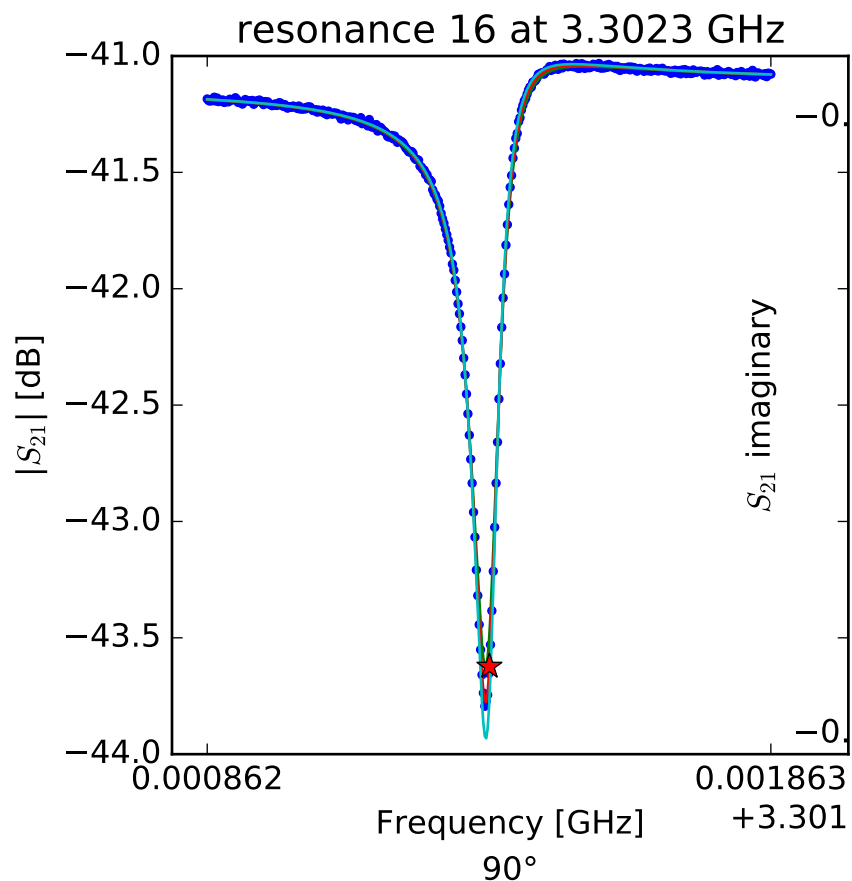
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.29414874649 \\ Q_r &= 12802.8545893 \\ Q_c &= 238505.343624 \\ a &= (-0.00384398638971 - 0.00806526946338j) \\ \phi_0 &= -0.619336119989 \\ \tau &= 36.8615641987 \end{aligned}$$



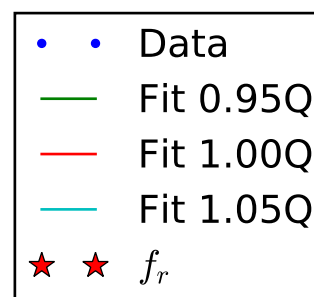
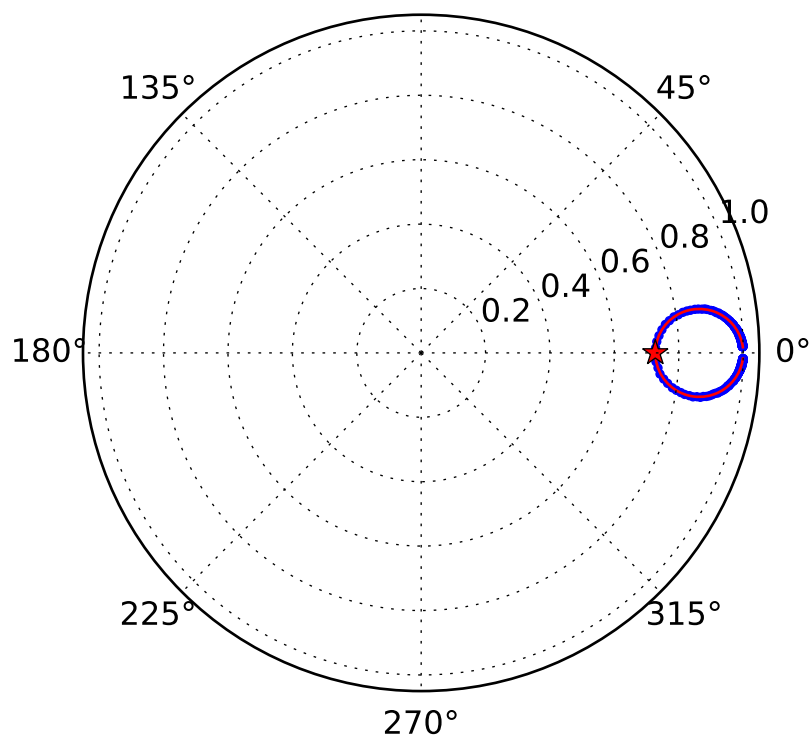
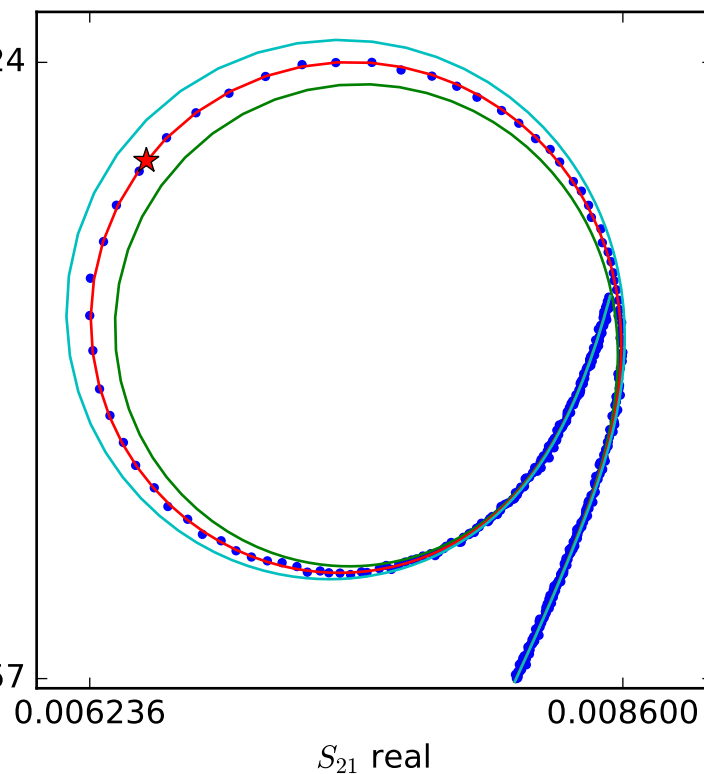
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.29824046244 \\ Q_r &= 21879.0624905 \\ Q_c &= 479402.207224 \\ a &= (0.00845576661417 - 0.00247320010965j) \\ \phi_0 &= -0.627059174137 \\ \tau &= 36.6414160892 \end{aligned}$$



S_{21} imaginary

Y-axis: S_{21} imaginary



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.30236322481$$

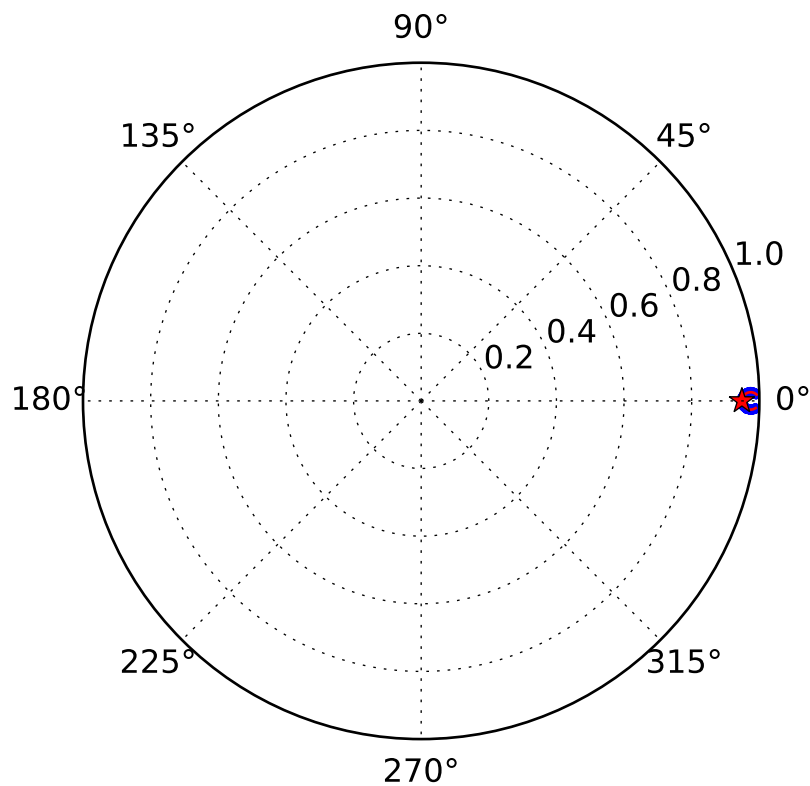
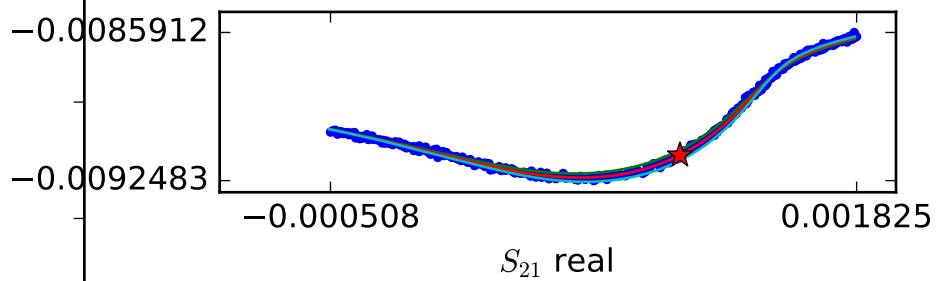
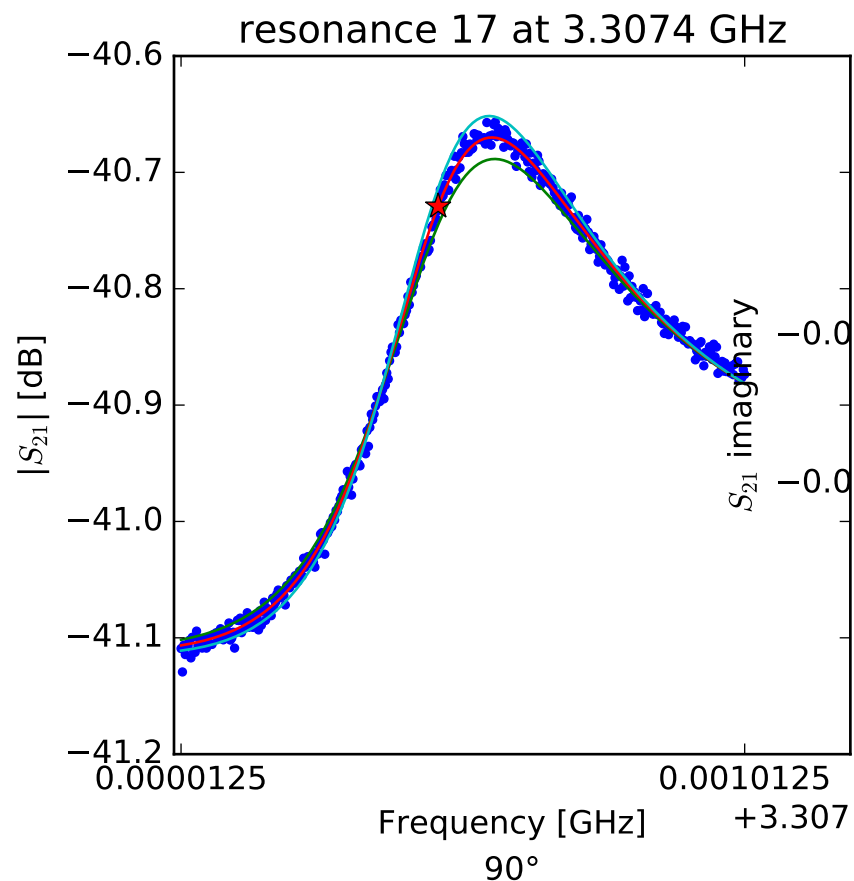
$$Q_r = 50841.4703347$$

$$Q_c = 186165.637744$$

$$a = (0.00460650217071 - 0.00748059800579j)$$

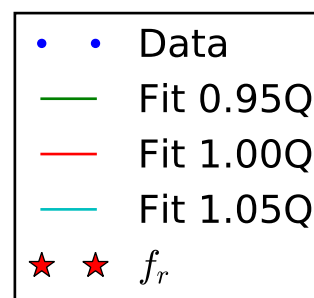
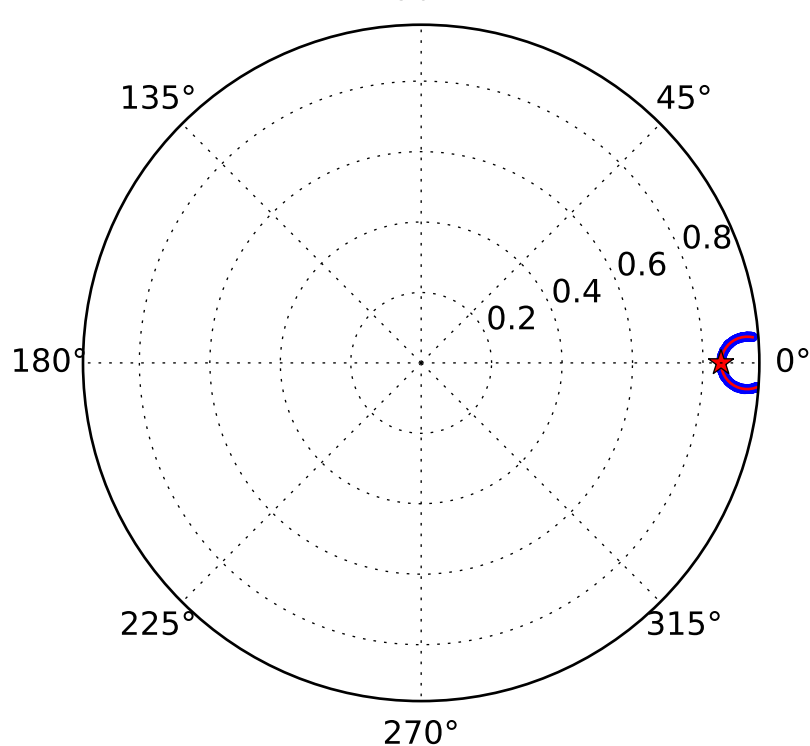
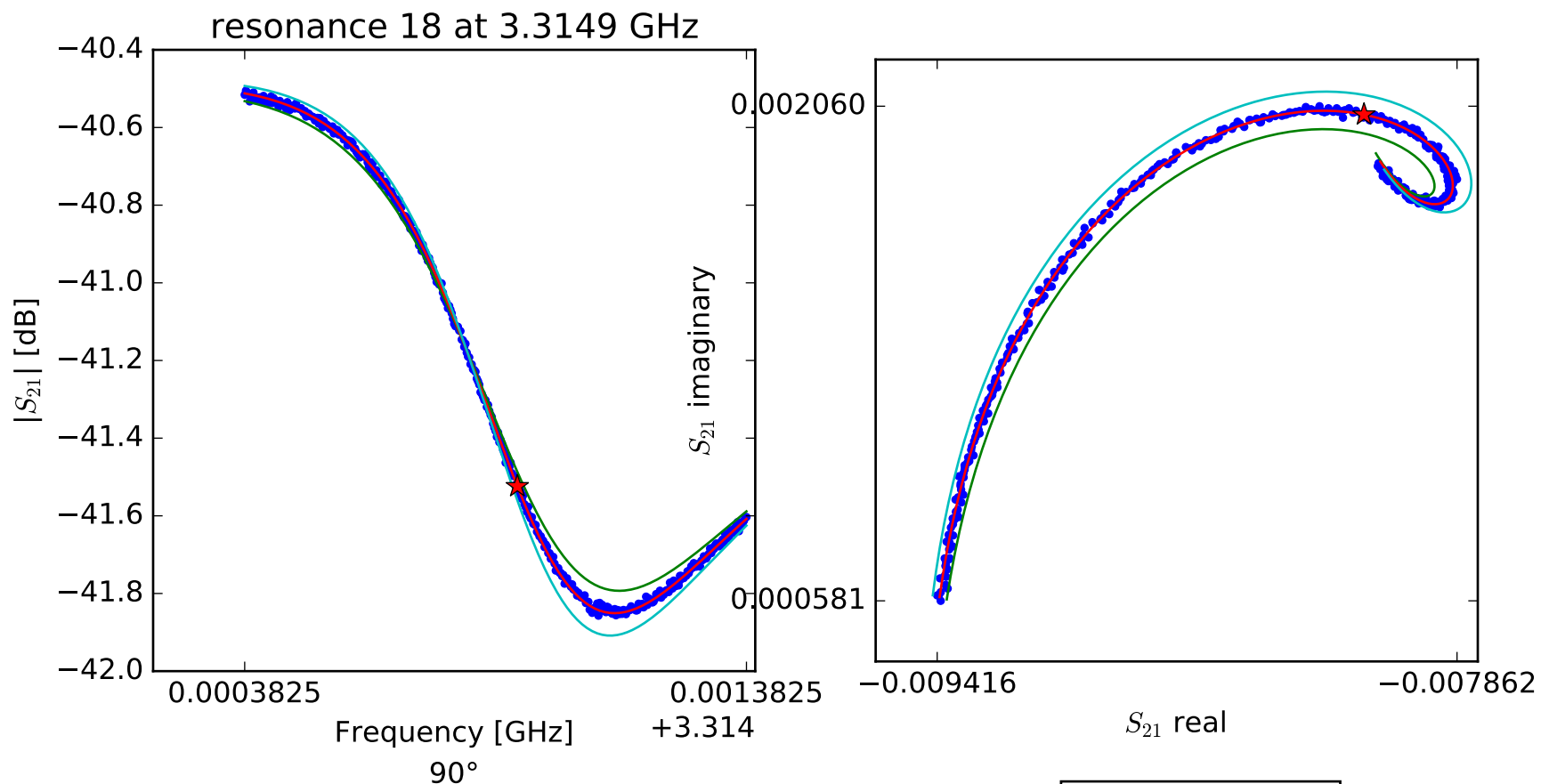
$$\phi_0 = -0.355841730639$$

$$\tau = 37.2116057383$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.30746868541 \\ Q_r &= 7018.64599436 \\ Q_c &= 135924.608963 \\ a &= (0.00659092079954 + 0.00592919885164j) \\ \phi_0 &= -2.35625054833 \\ \tau &= 37.2956297881 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.31492591372$$

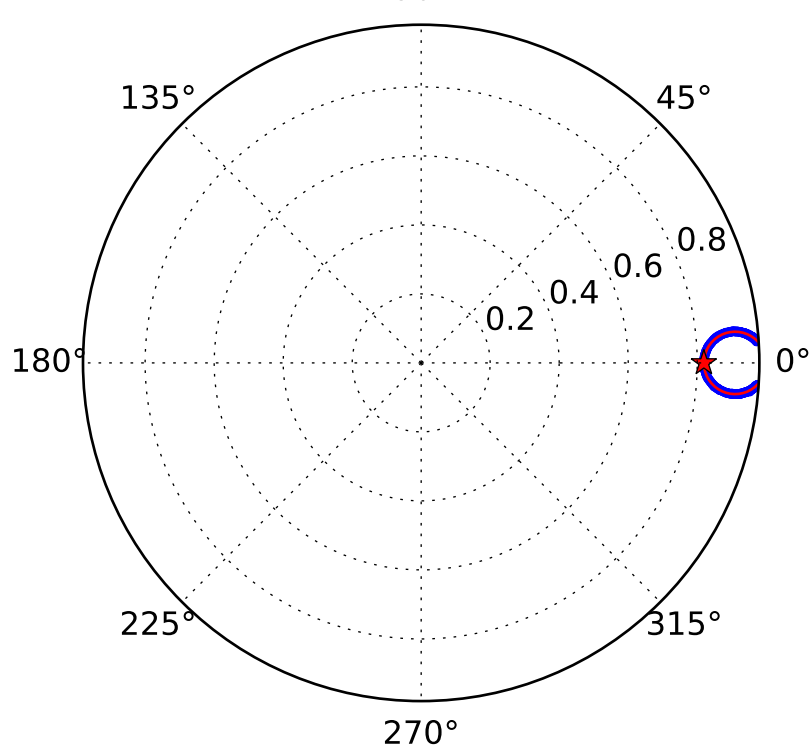
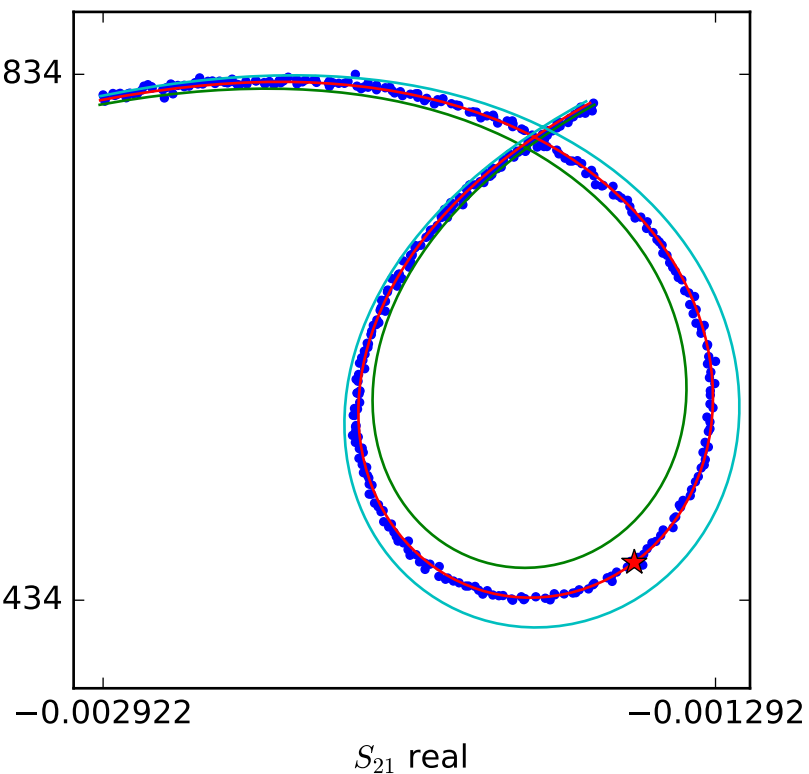
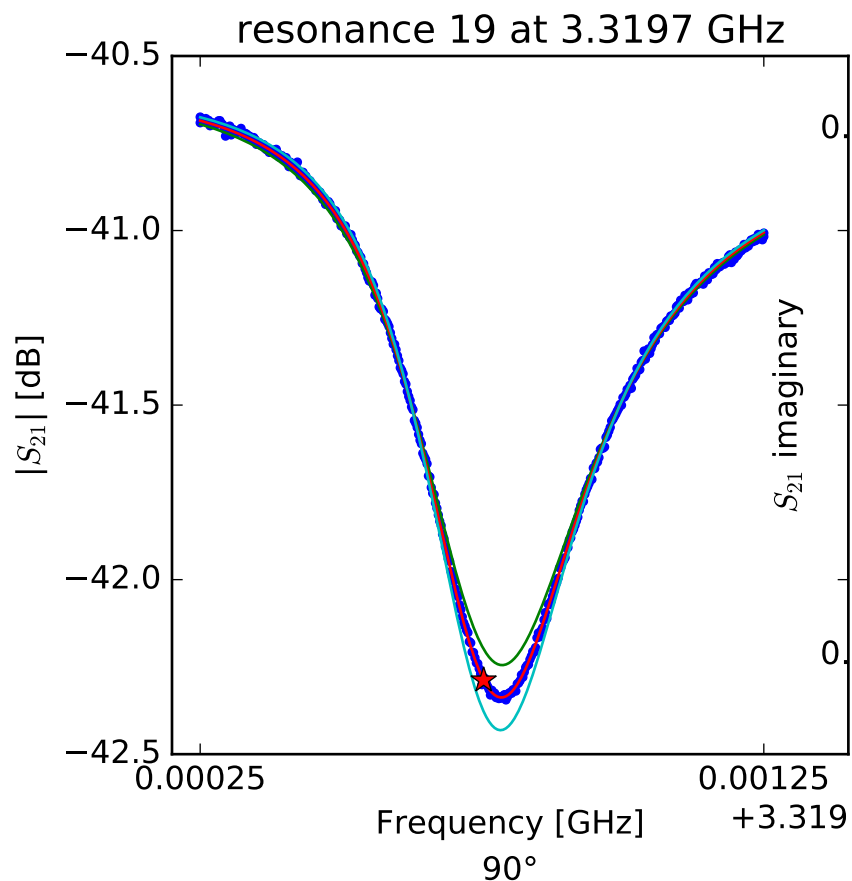
$$Q_r = 4459.53112779$$

$$Q_c = 29972.3696003$$

$$a = (-0.00067435362841 + 0.00914676249905j)$$

$$\phi_0 = 0.89919460743$$

$$\tau = 38.8486486031$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.3197529109$$

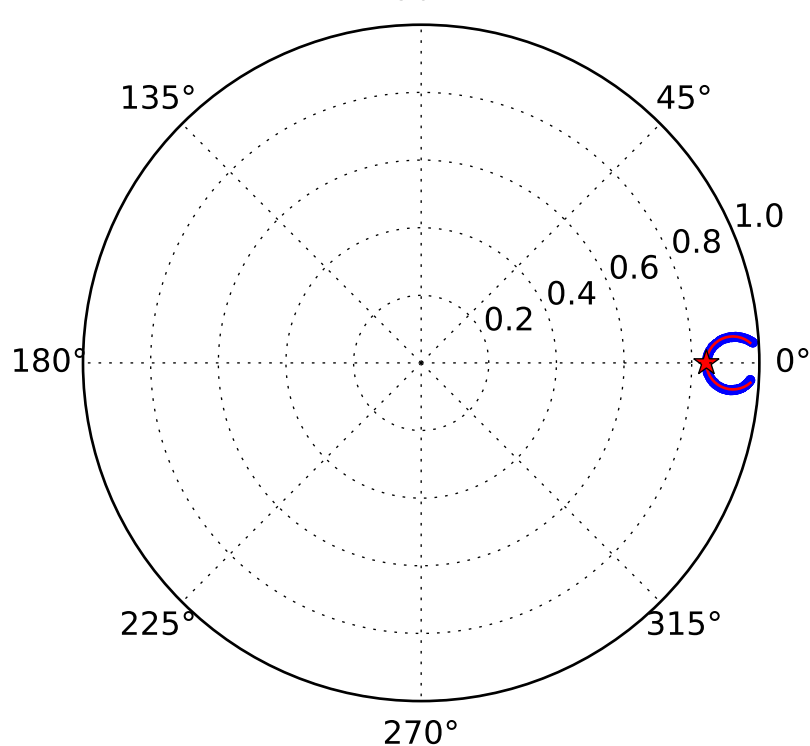
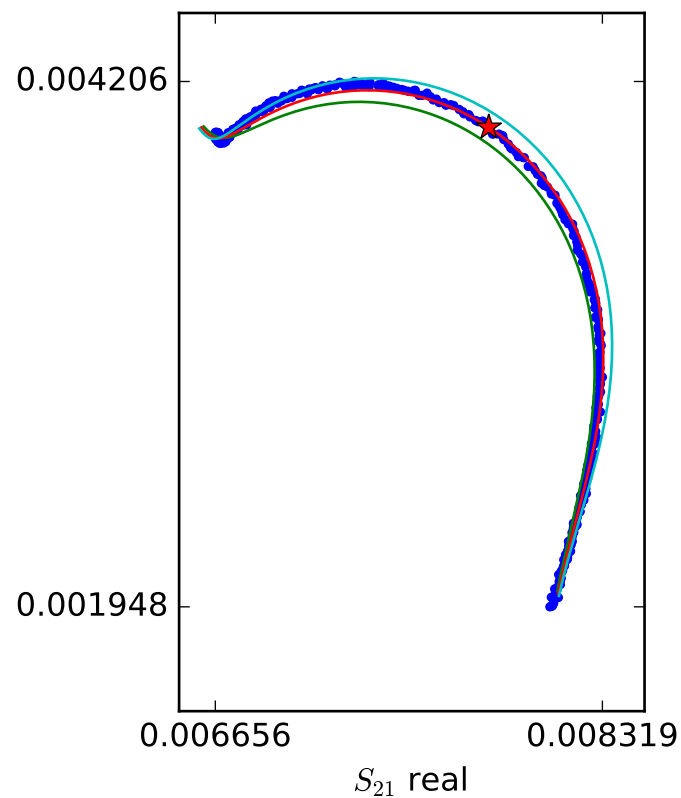
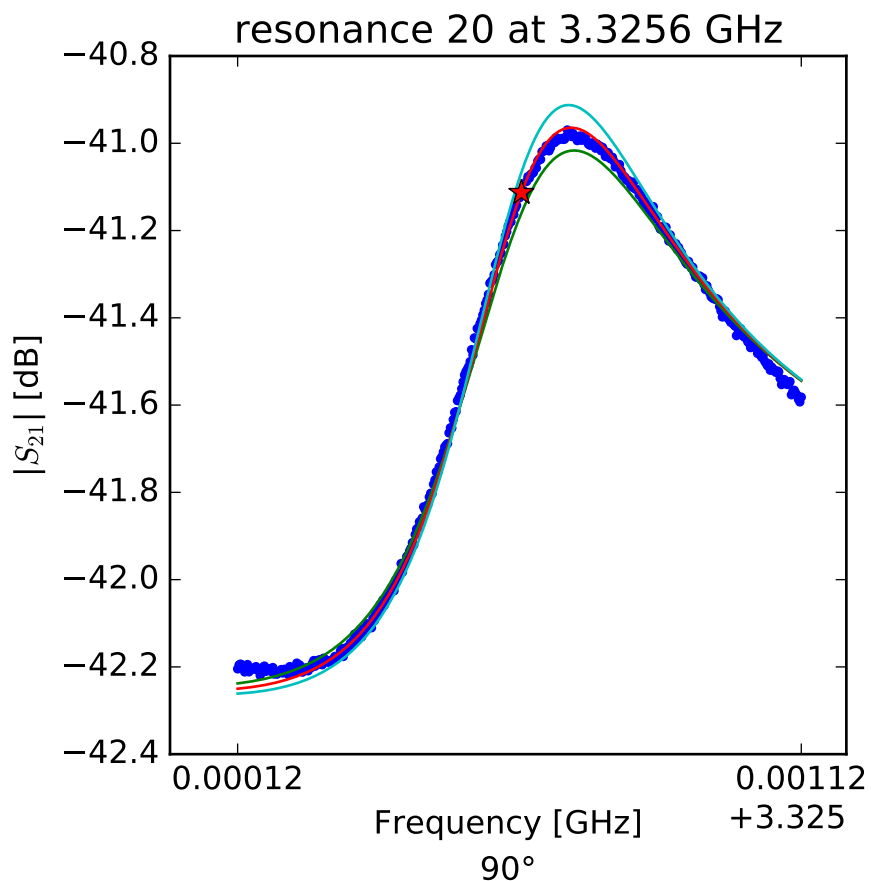
$$Q_r = 8228.74456472$$

$$Q_c = 45498.3143241$$

$$a = (0.000856666807451 - 0.00924375441404j)$$

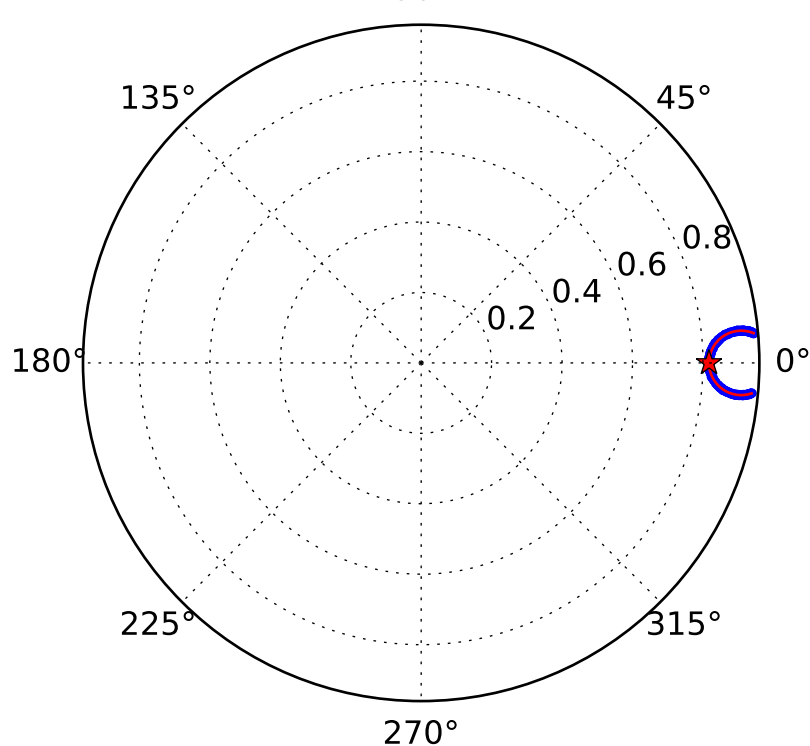
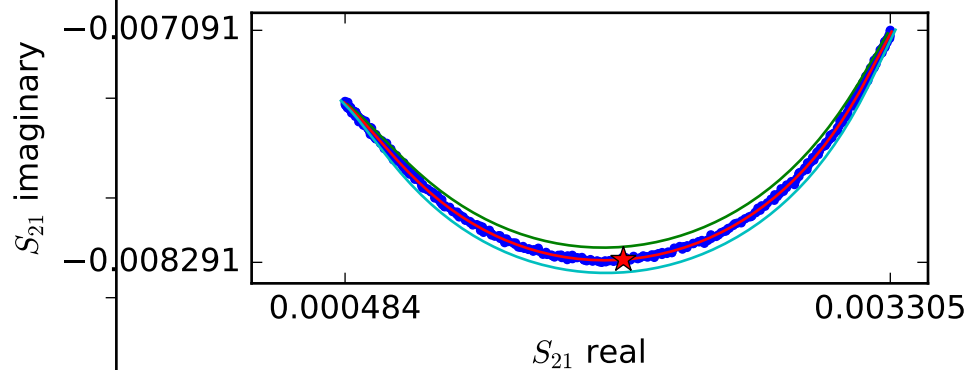
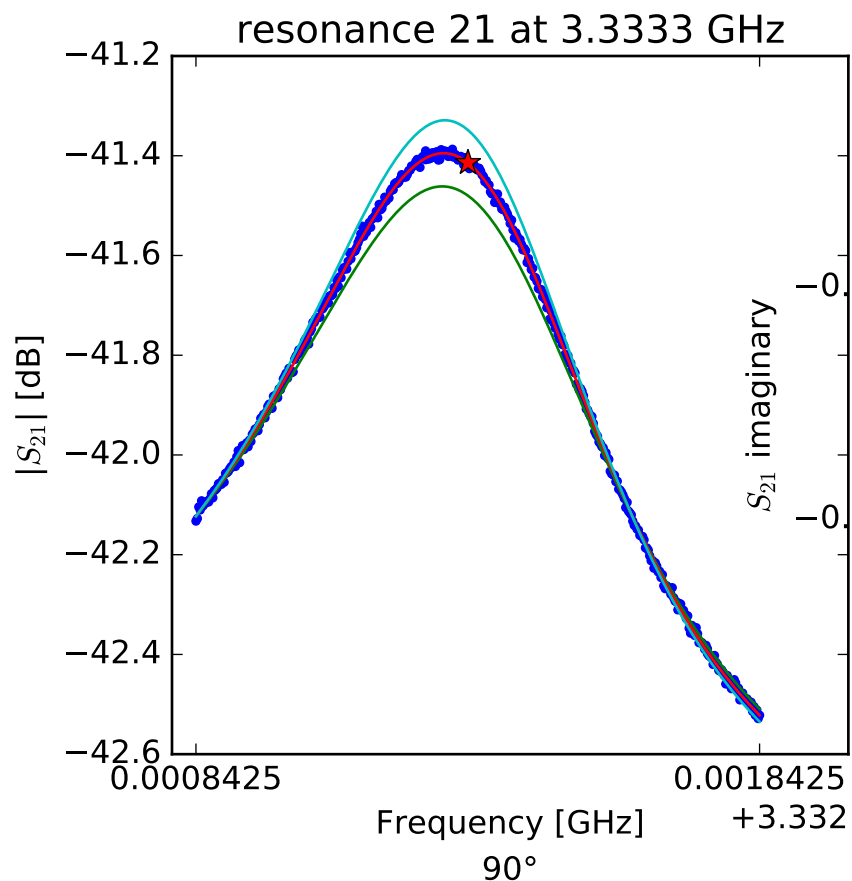
$$\phi_0 = 0.280724314789$$

$$\tau = 41.7120300157$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.32562346225 \\ Q_r &= 7309.7461518 \\ Q_c &= 46675.0323239 \\ a &= (-0.00772319796271 + 0.0015988364963j) \\ \phi_0 &= -2.34783662723 \\ \tau &= 35.3041059785 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.33332510409$$

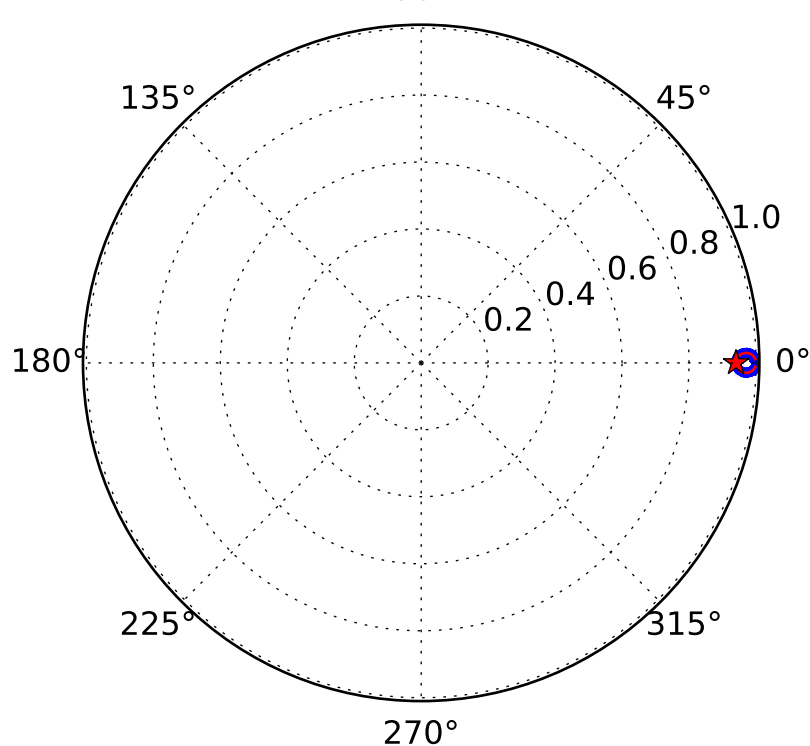
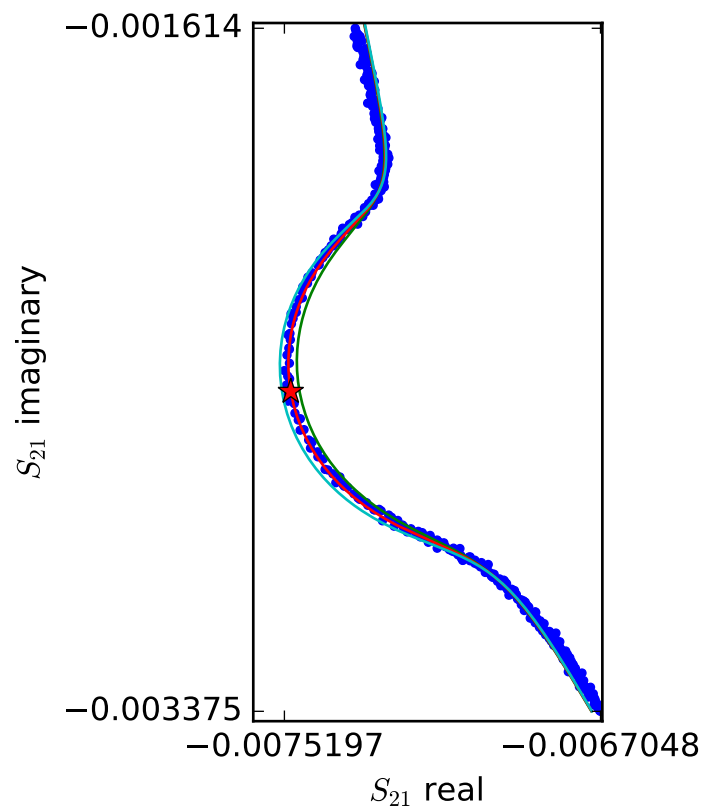
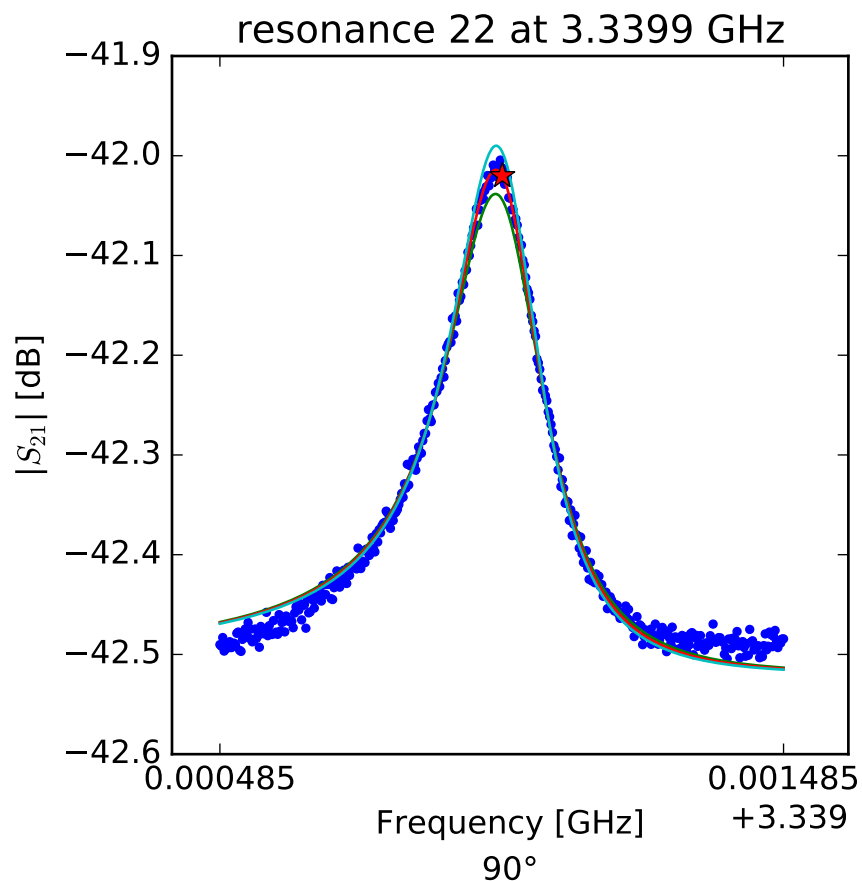
$$Q_r = 4818.17543234$$

$$Q_c = 26329.8595995$$

$$a = (0.00182282258135 + 0.00698377942445j)$$

$$\phi_0 = 2.87041868156$$

$$\tau = 34.6250034117$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.33998599673$$

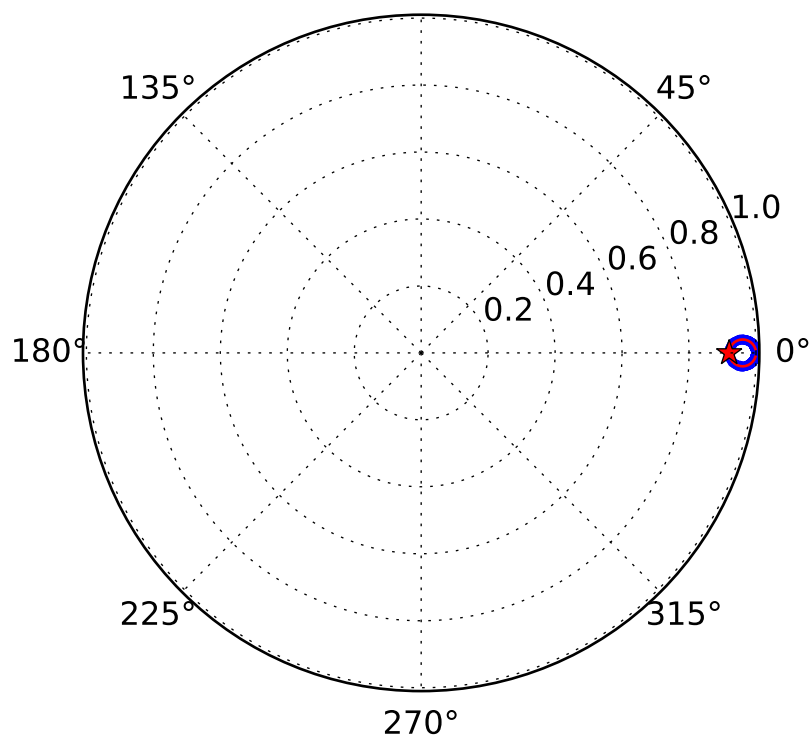
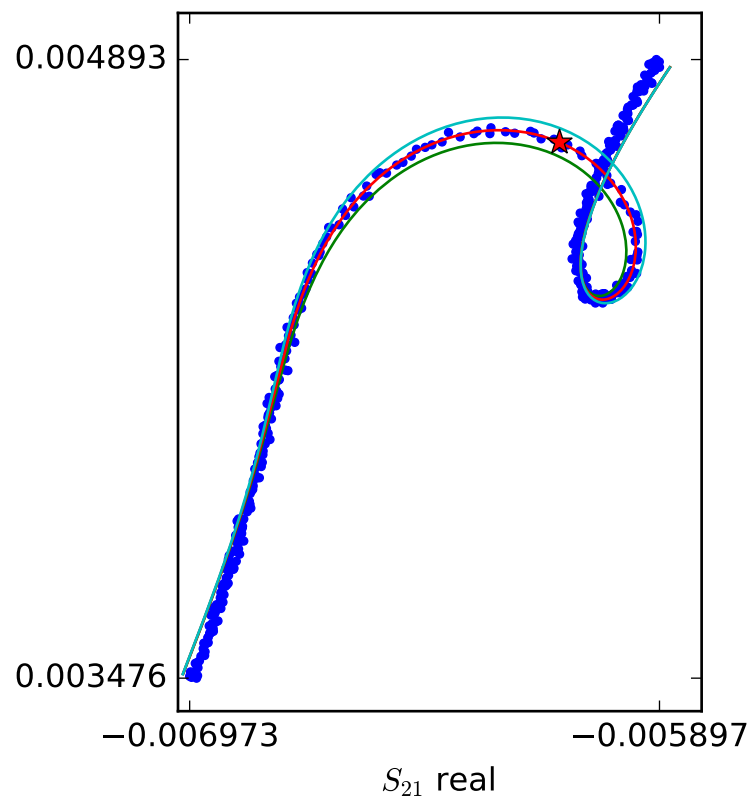
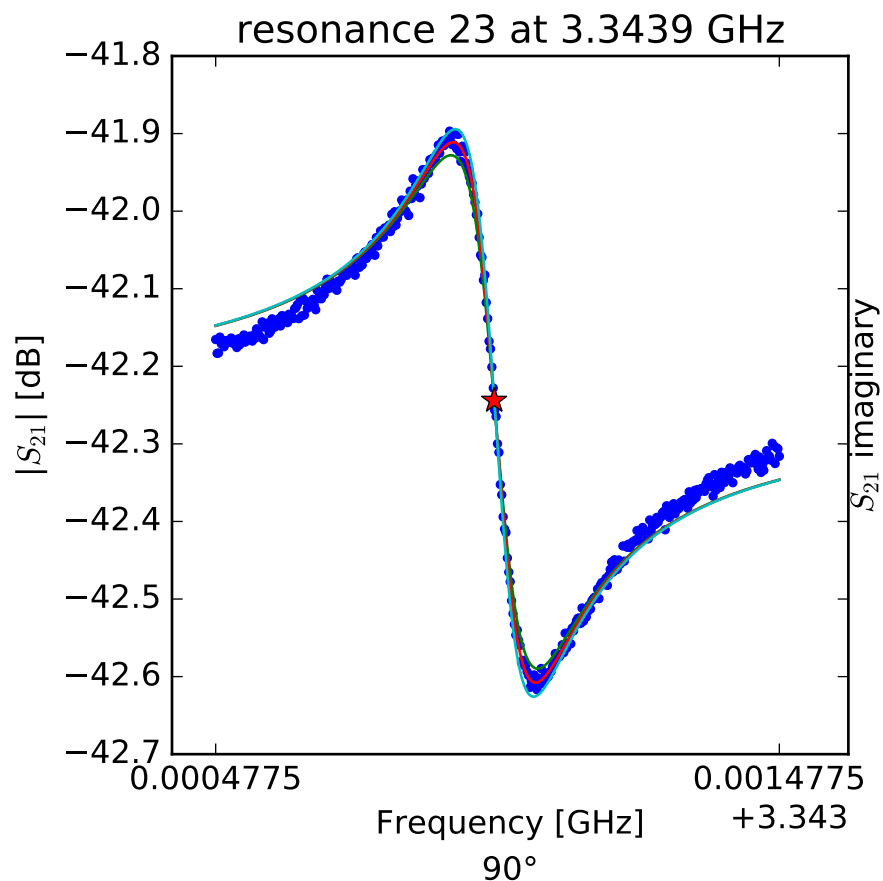
$$Q_r = 16588.274564$$

$$Q_c = 277792.339964$$

$$a = (0.00460326973573 + 0.00590725706801j)$$

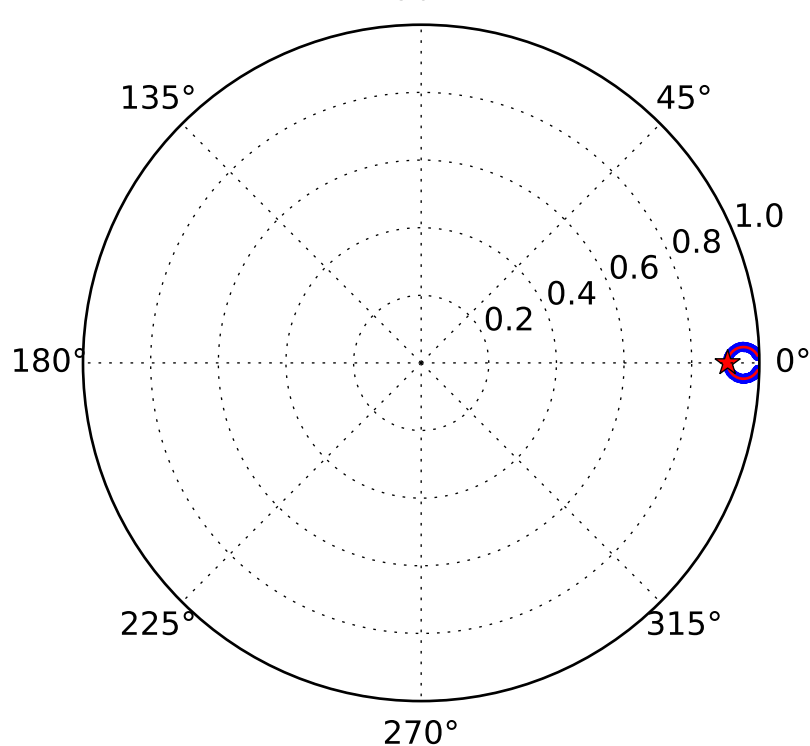
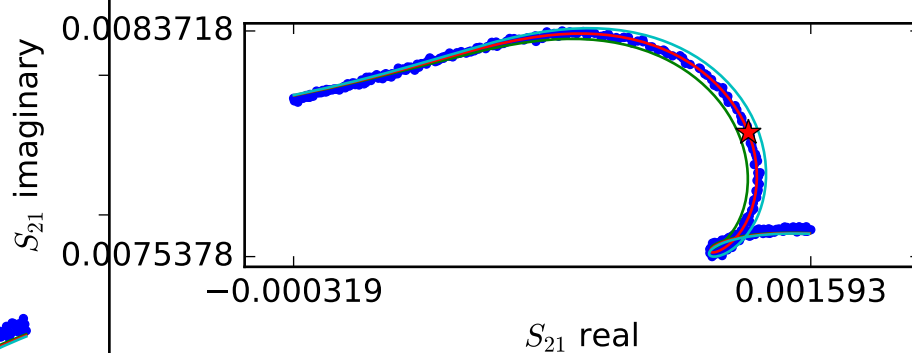
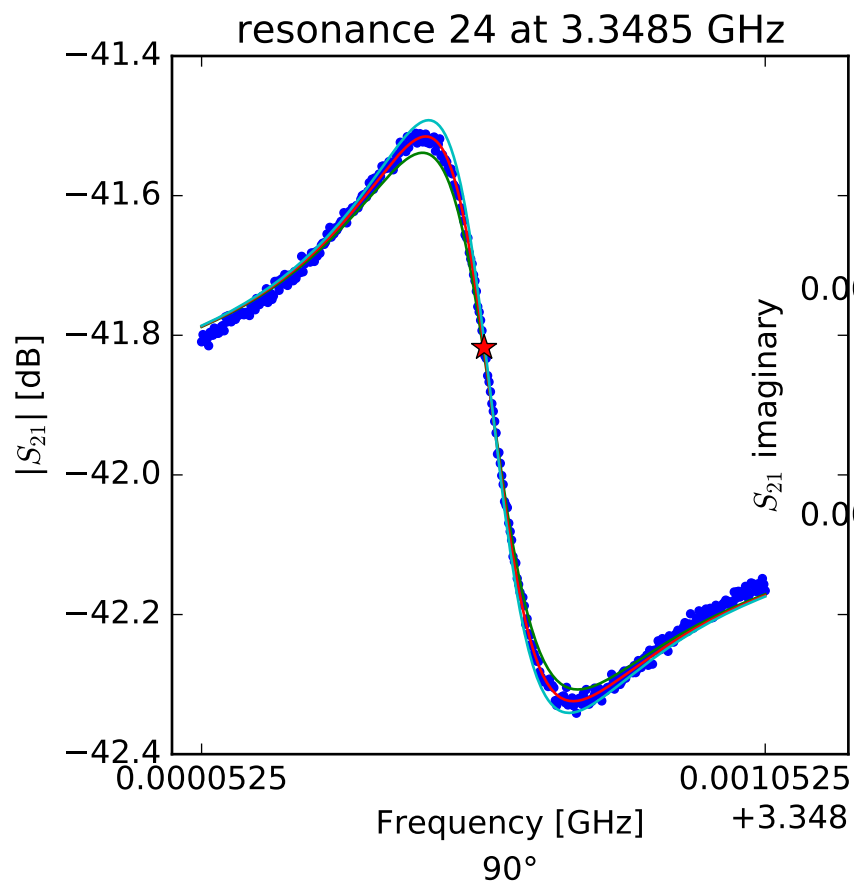
$$\phi_0 = 2.90906800637$$

$$\tau = 36.105071289$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.34397164101 \\ Q_r &= 22902.7892457 \\ Q_c &= 285836.86641 \\ a &= (-0.00613509338109 + 0.0046869754101j) \\ \phi_0 &= 1.53502149656 \\ \tau &= 36.7789116706 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.34855376862$$

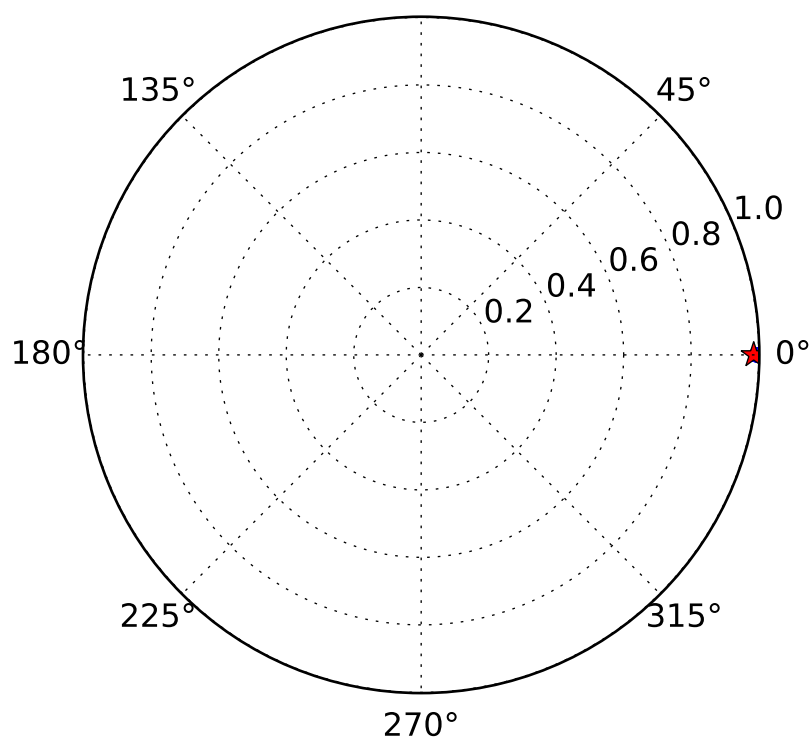
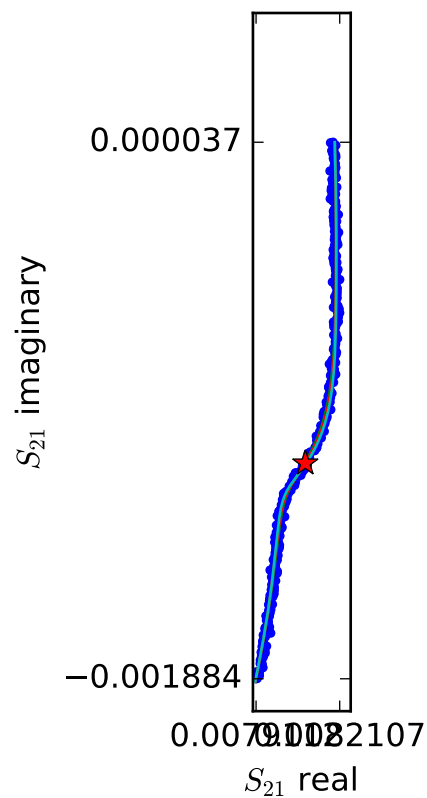
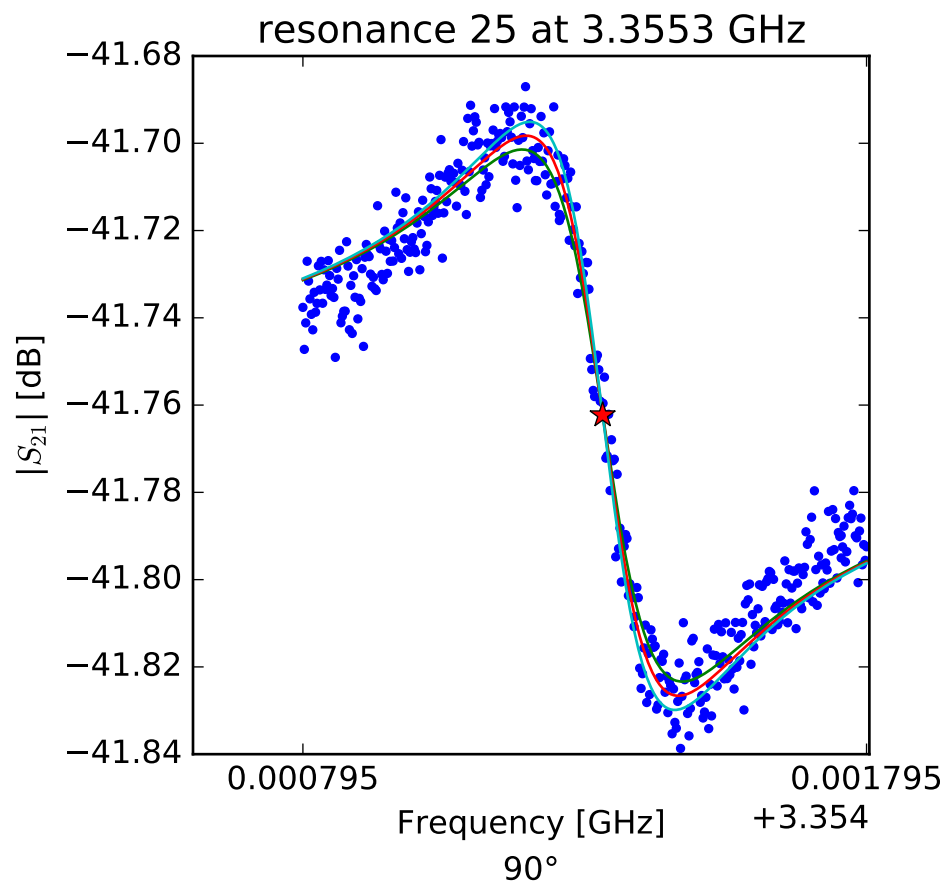
$$Q_r = 13089.4852991$$

$$Q_c = 139446.190259$$

$$a = (-0.00278861350433 + 0.00745173376792j)$$

$$\phi_0 = 1.73455472206$$

$$\tau = 37.6488999808$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.35532676578$$

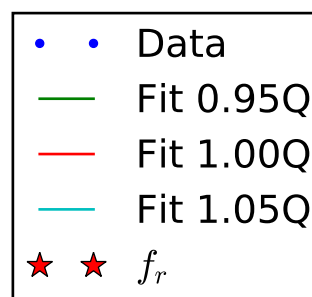
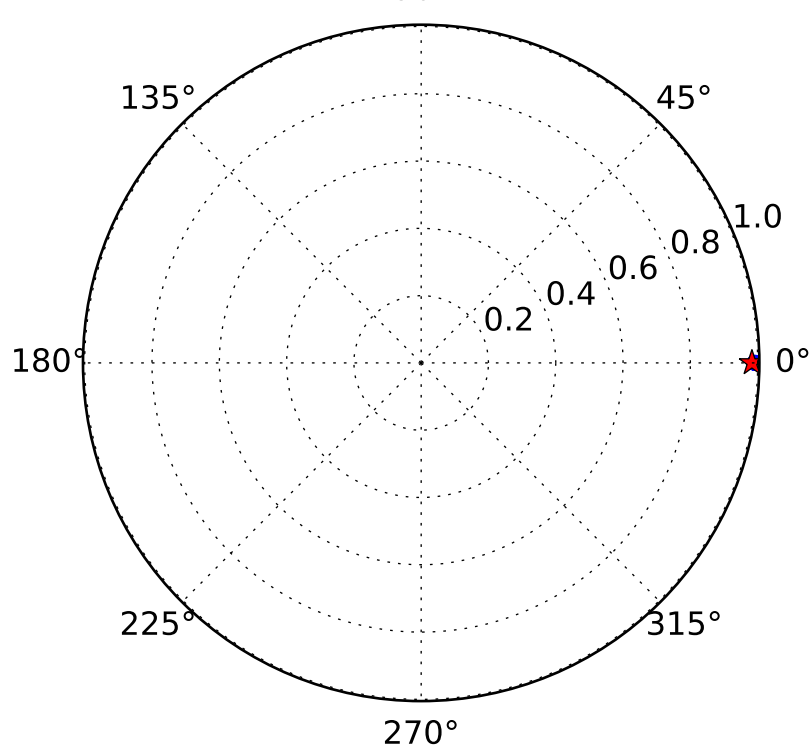
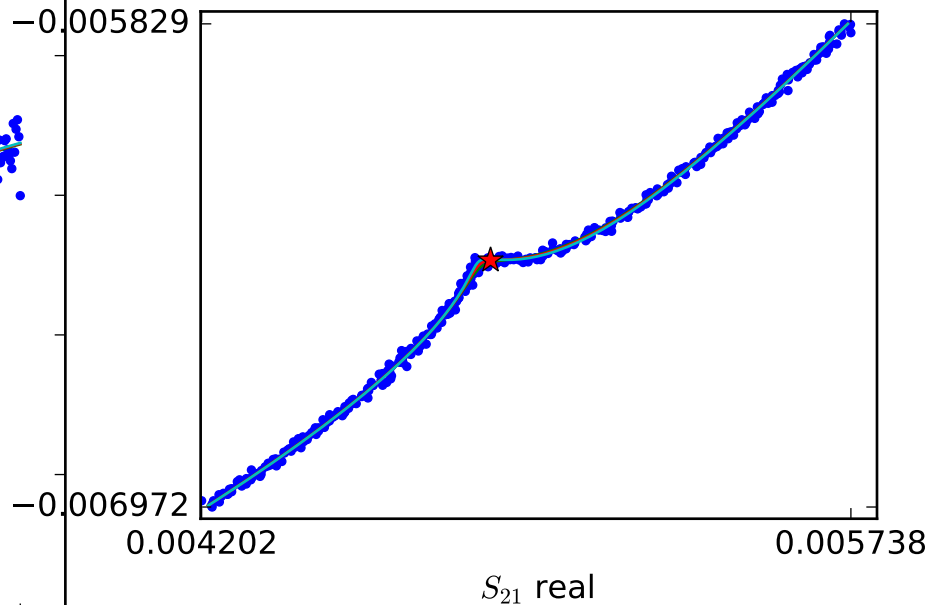
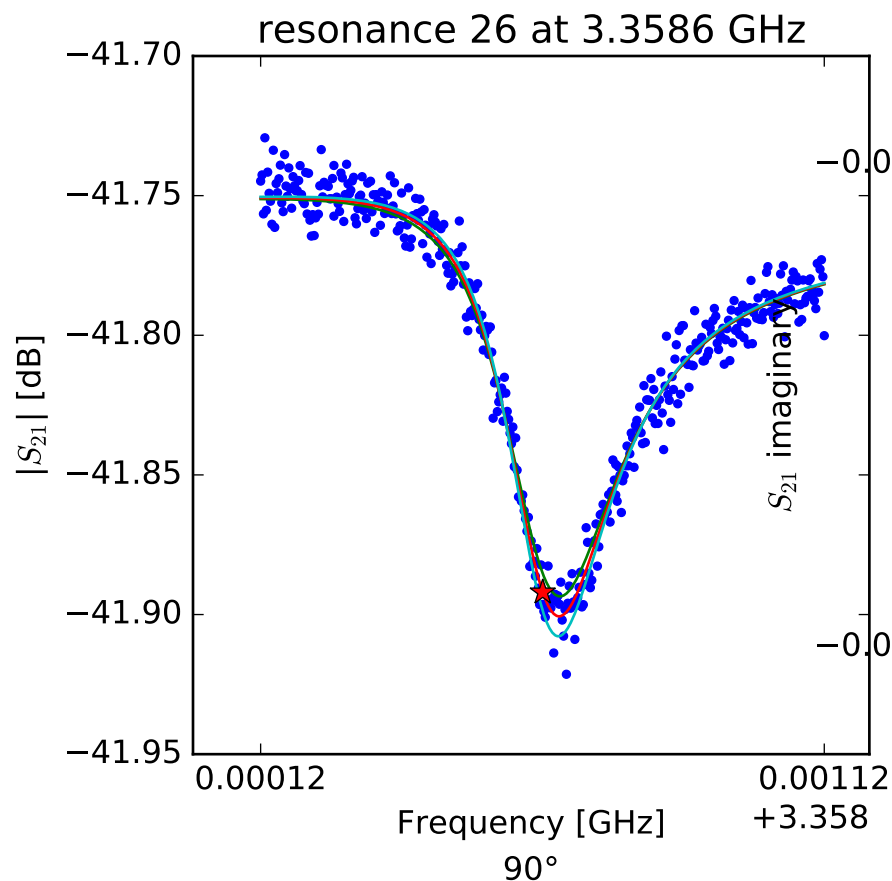
$$Q_r = 12420.852355$$

$$Q_c = 840540.177237$$

$$a = (0.00501801529404 - 0.00644011587715j)$$

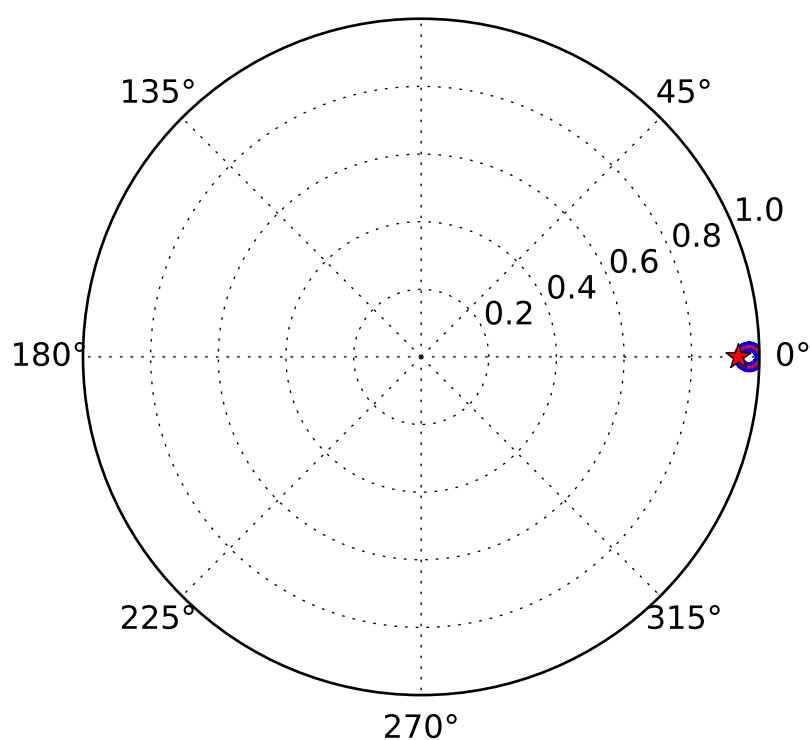
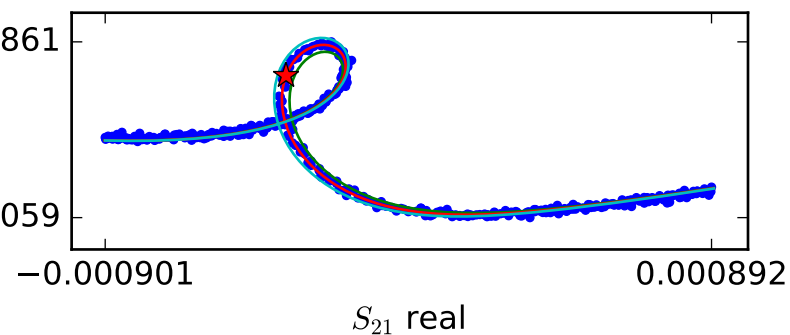
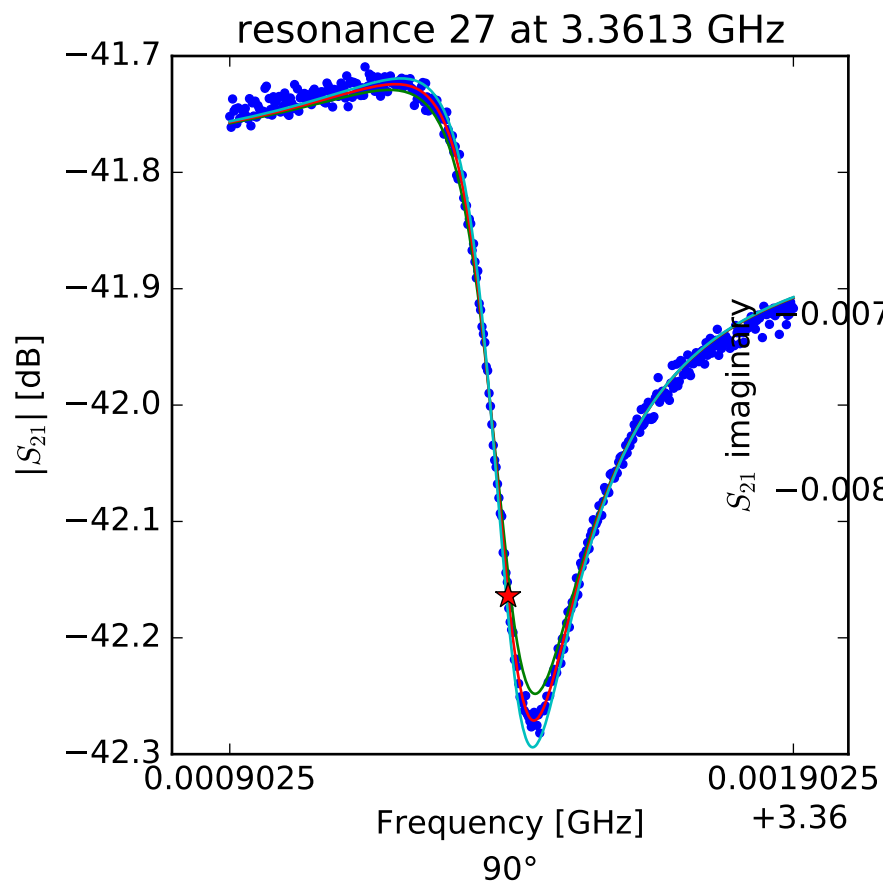
$$\phi_0 = 1.5583297074$$

$$\tau = 38.1109655225$$



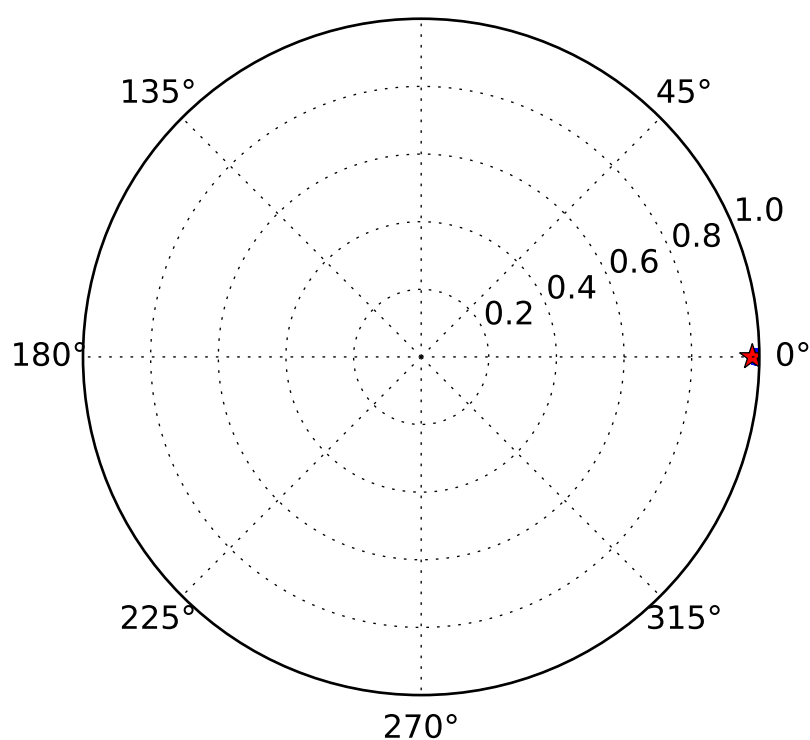
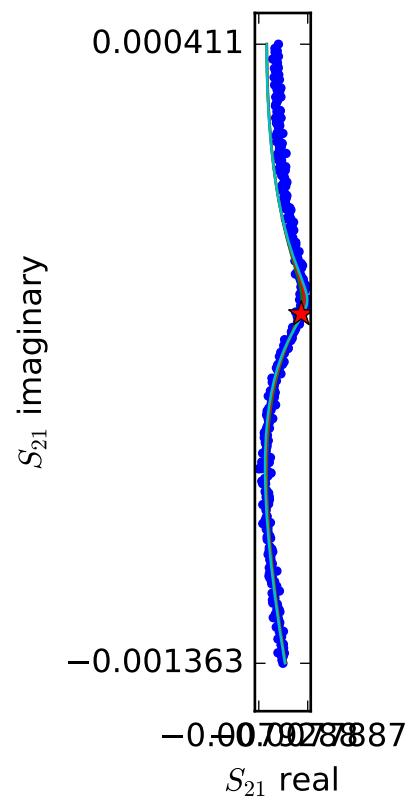
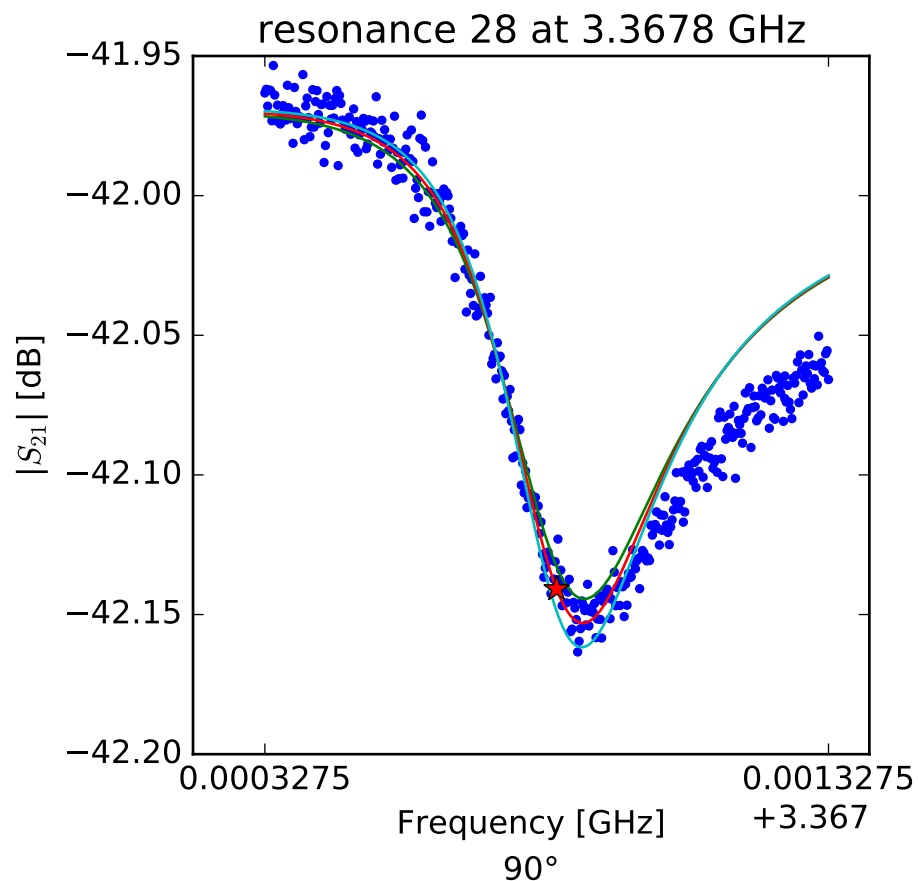
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.3586204828 \\ Q_r &= 14176.4808936 \\ Q_c &= 828084.936575 \\ a &= (0.00482654695446 - 0.00658771817506j) \\ \phi_0 &= 0.476772563001 \\ \tau &= 38.1095315208 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.36139629892 \\ Q_r &= 17597.3409429 \\ Q_c &= 285165.206018 \\ a &= (0.00595123178848 - 0.00550780281236j) \\ \phi_0 &= 0.867798884566 \\ \tau &= 37.8208413837 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.36784503107$$

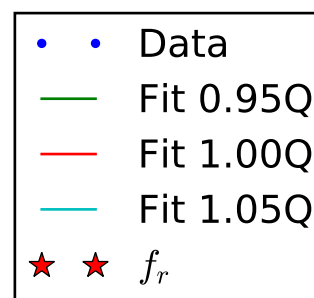
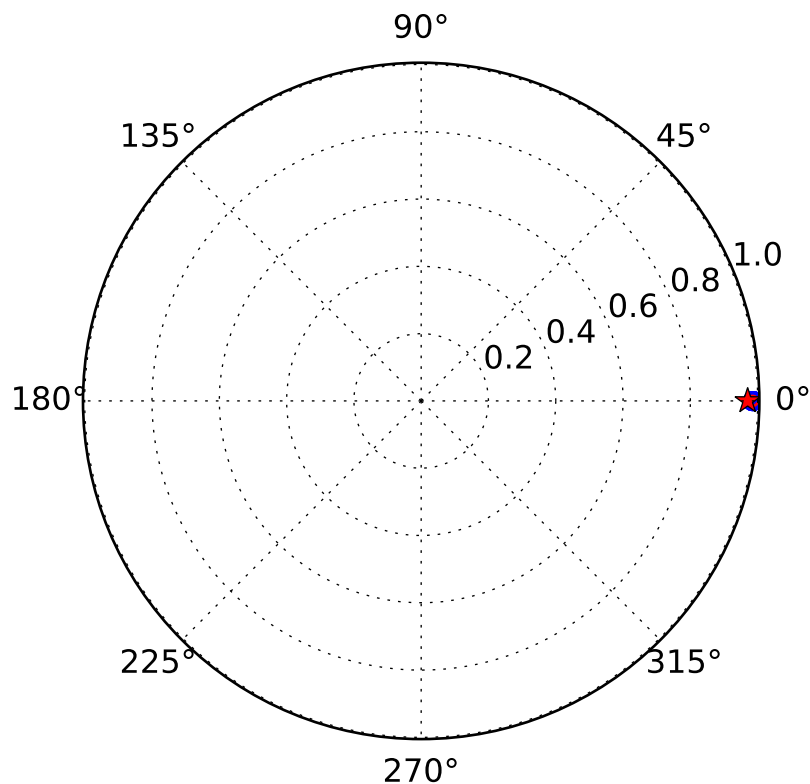
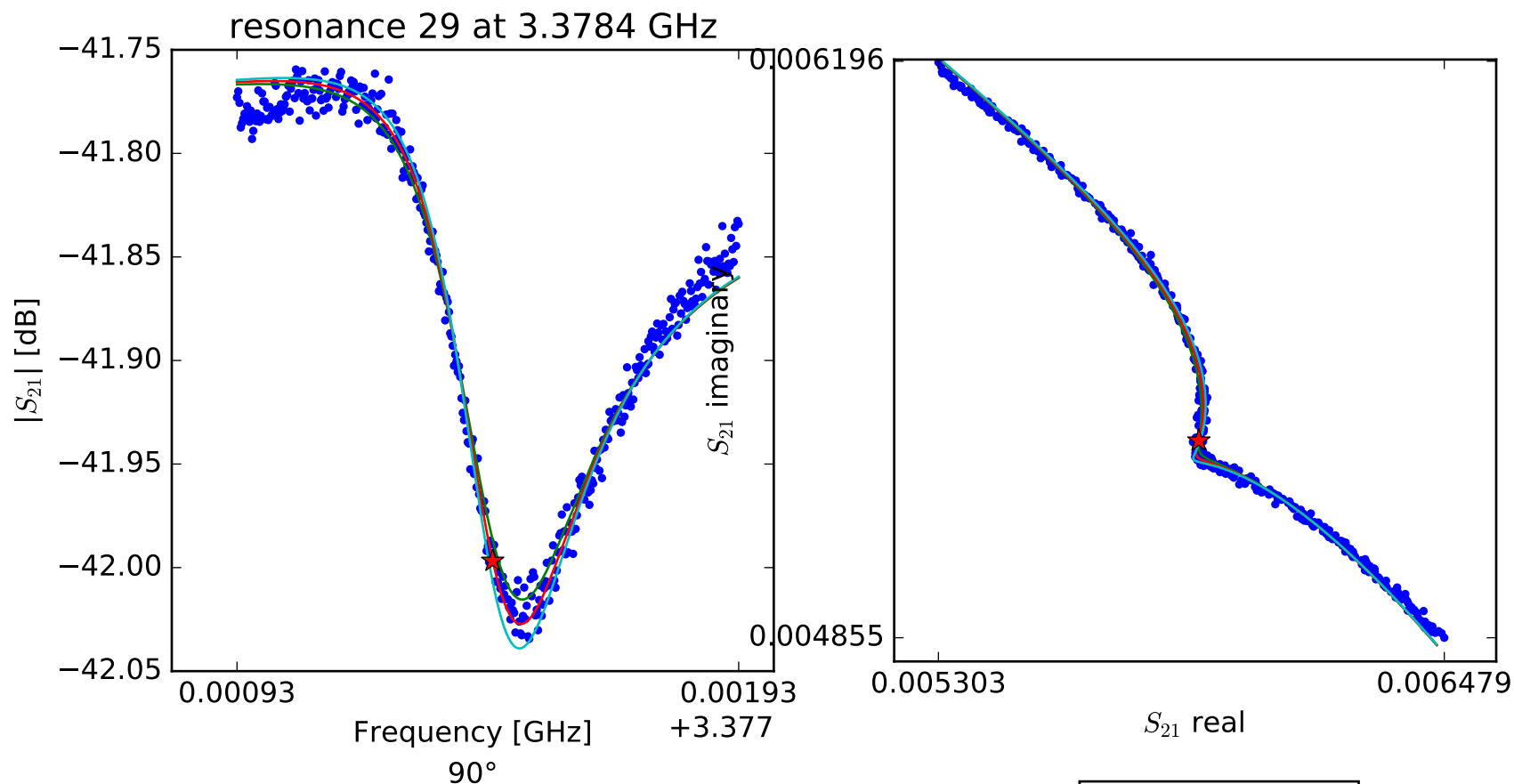
$$Q_r = 9541.93063405$$

$$Q_c = 456277.300277$$

$$a = (-0.00631142025965 + 0.00485085345789j)$$

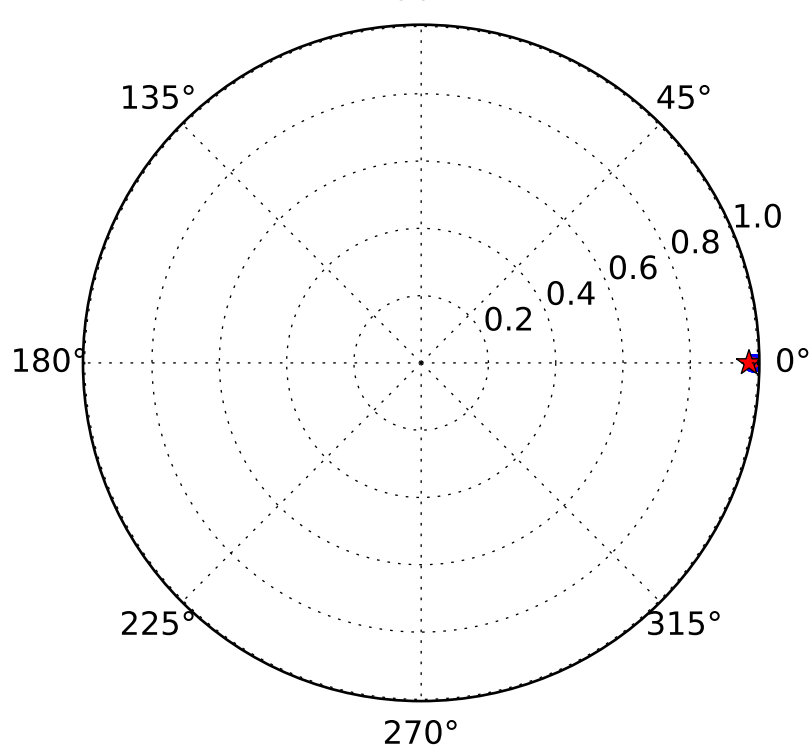
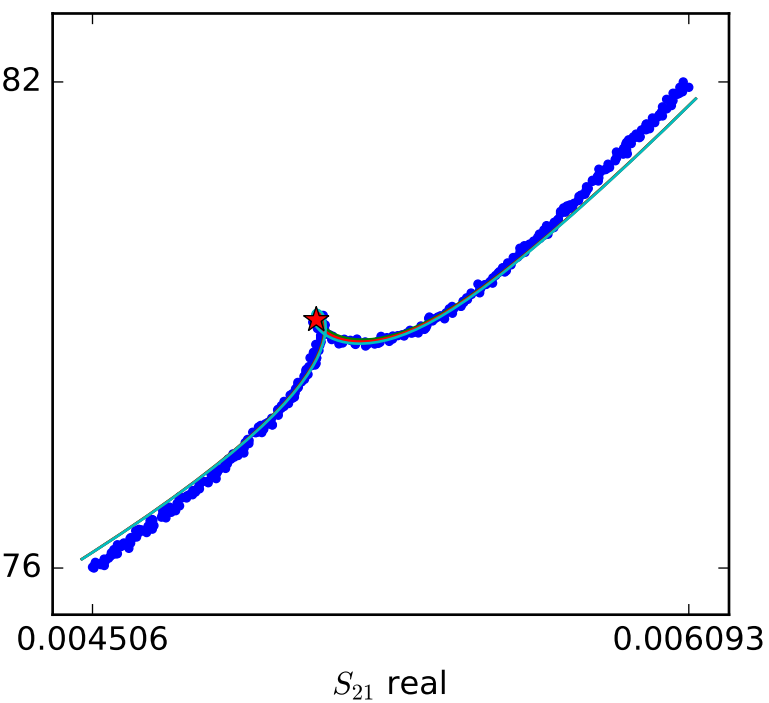
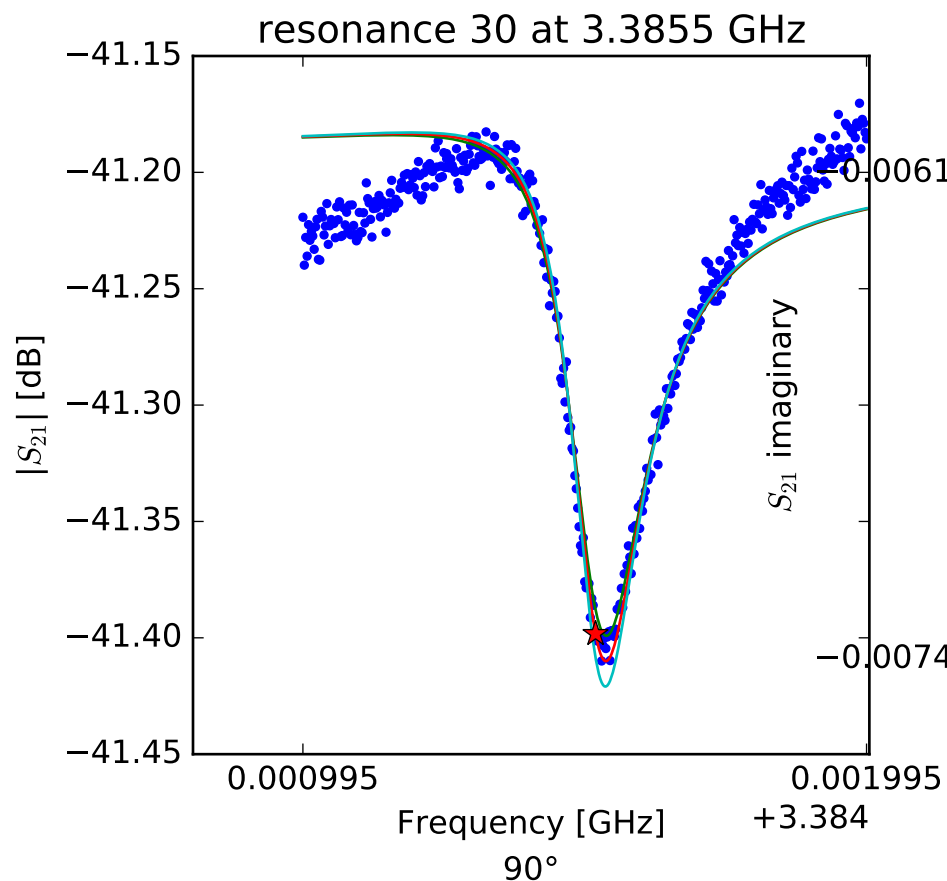
$$\phi_0 = 0.512326284235$$

$$\tau = 37.3789970362$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.37843969115 \\ Q_r &= 10785.3609266 \\ Q_c &= 361505.181578 \\ a &= (0.00759221937823 - 0.00291889451318j) \\ \phi_0 &= 0.676644232197 \\ \tau &= 36.9466329824 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.38551417954$$

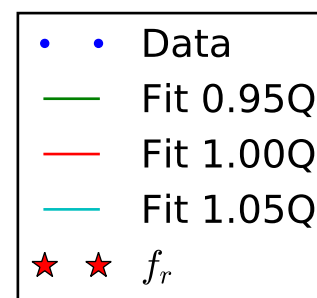
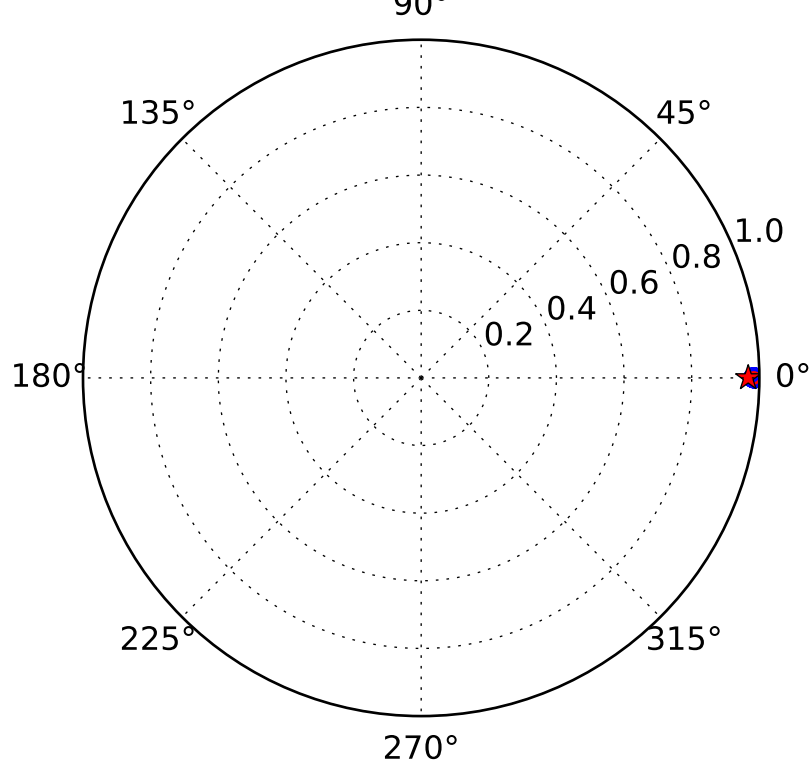
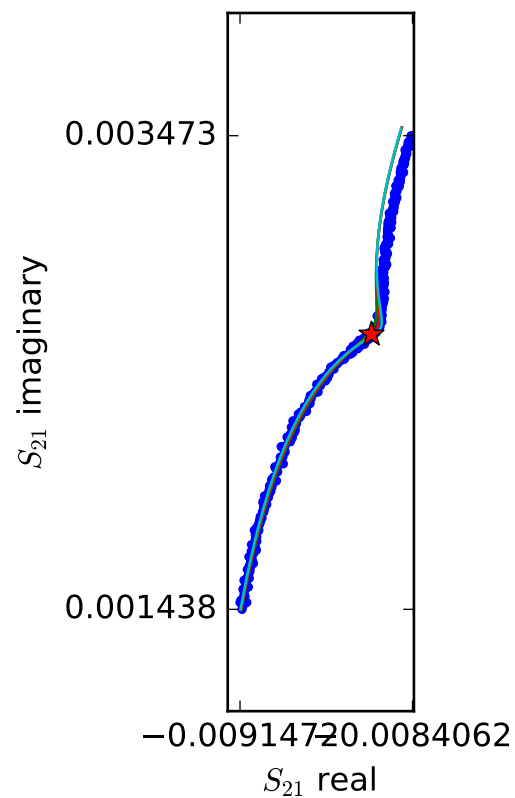
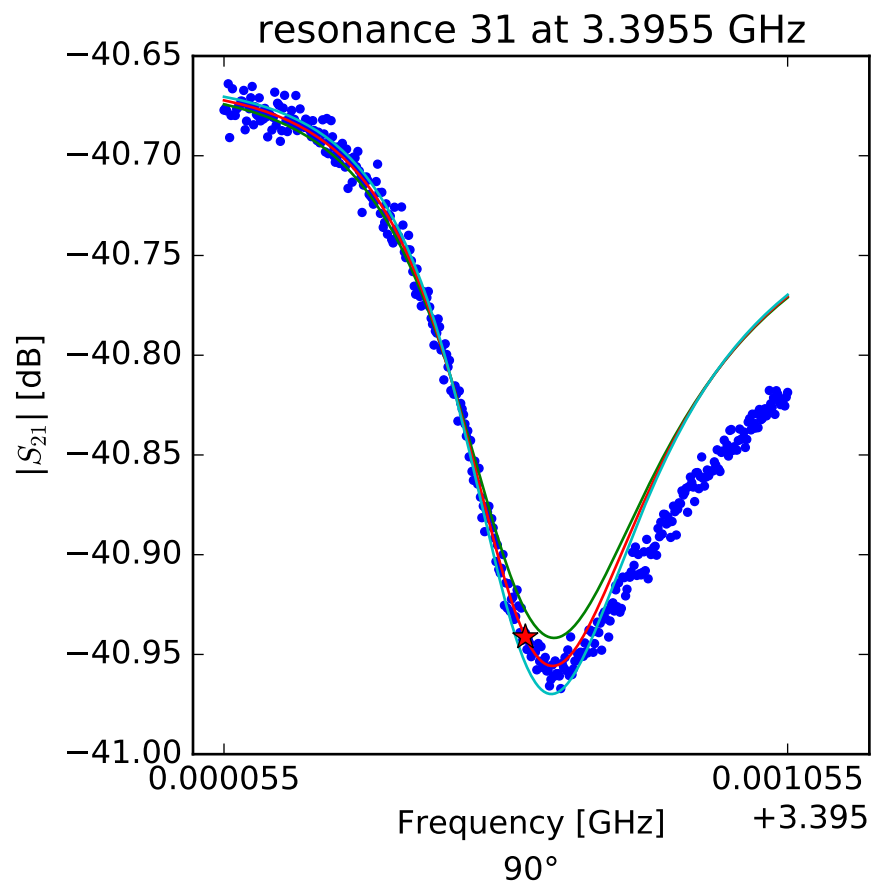
$$Q_r = 21334.2336133$$

$$Q_c = 827319.942356$$

$$a = (-0.00420229985419 + 0.00763488295734j)$$

$$\phi_0 = 0.449260779826$$

$$\tau = 38.5394889066$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.39558969427$$

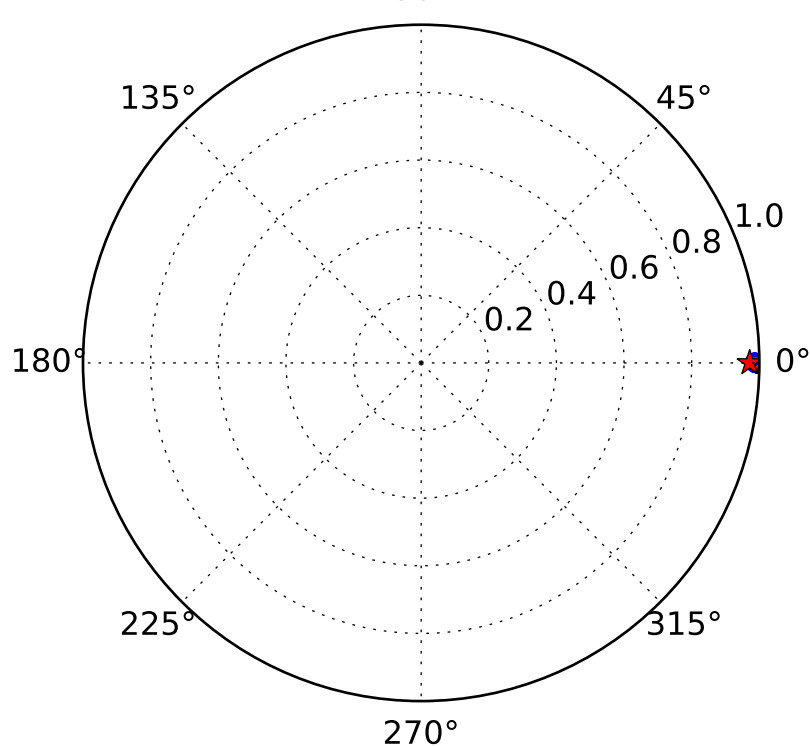
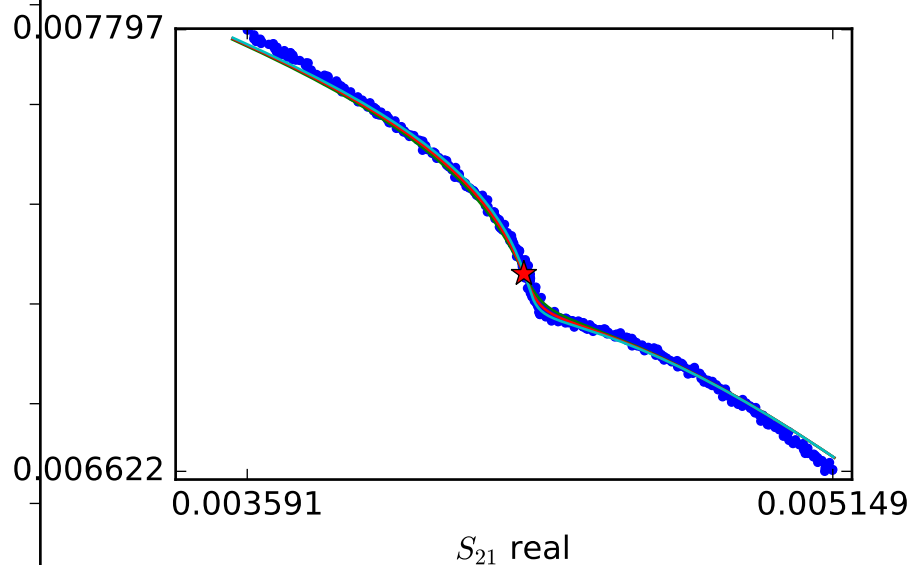
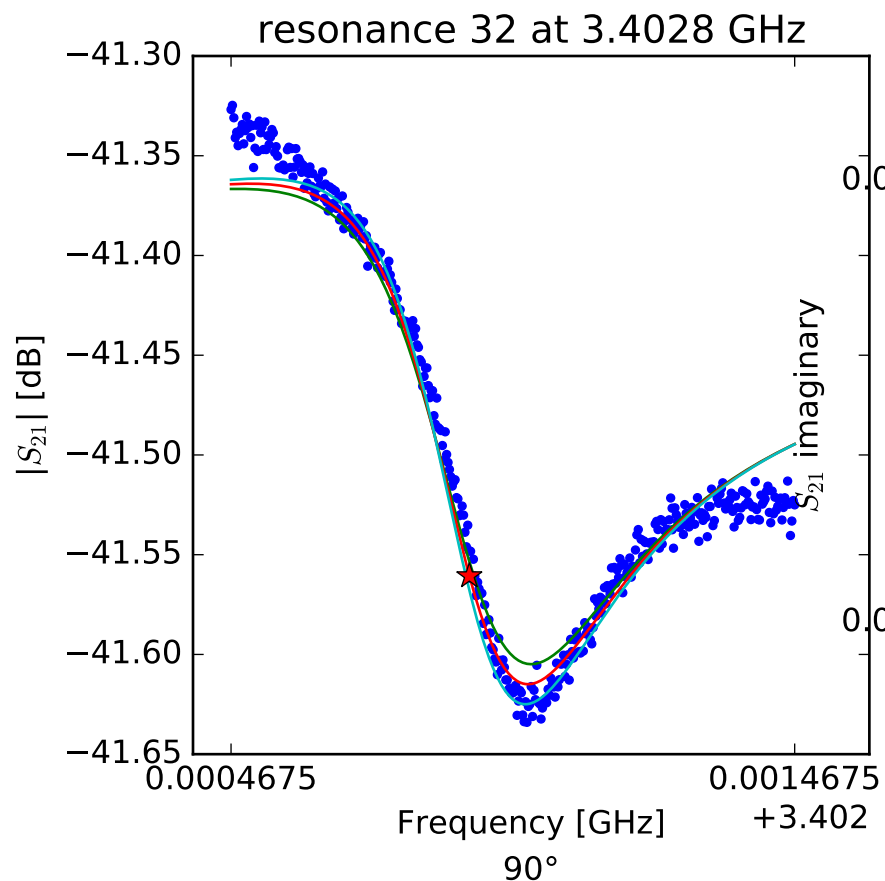
$$Q_r = 7909.86745837$$

$$Q_c = 239960.071912$$

$$a = (0.00320038623404 + 0.00867694253768j)$$

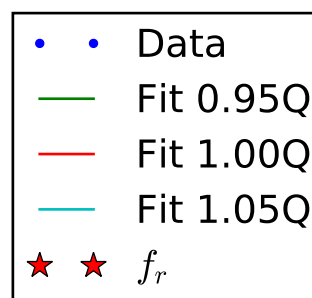
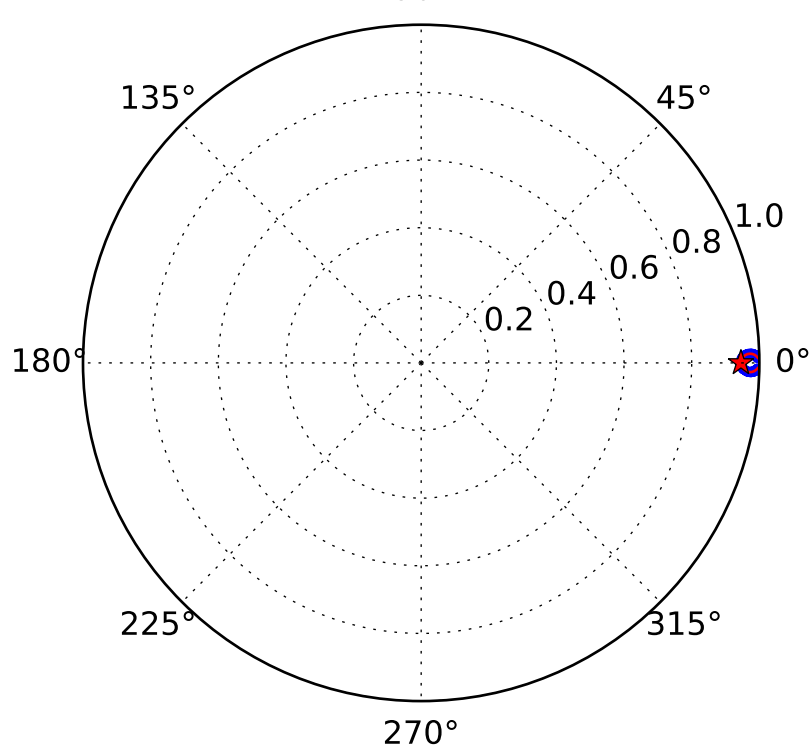
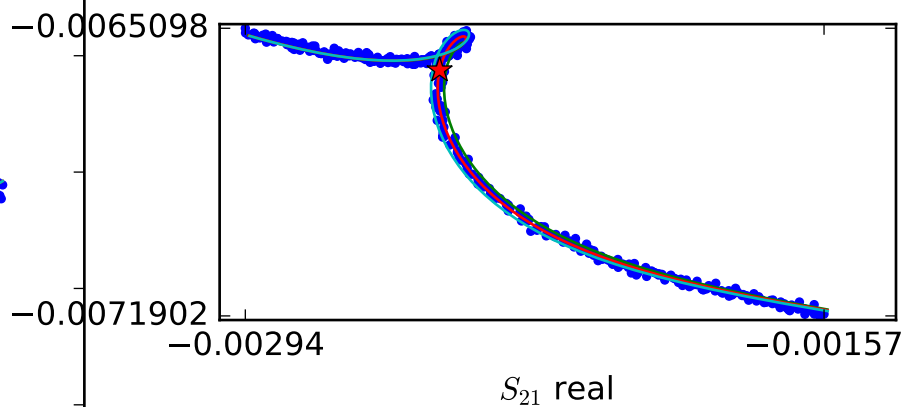
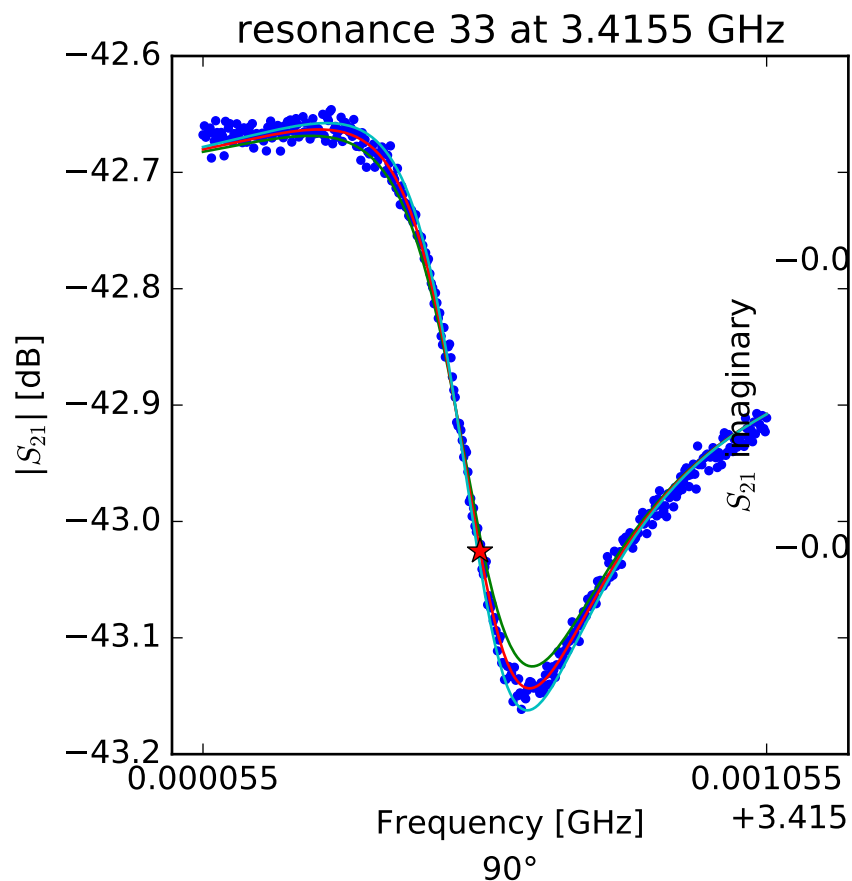
$$\phi_0 = 0.43627076182$$

$$\tau = 41.1529757041$$



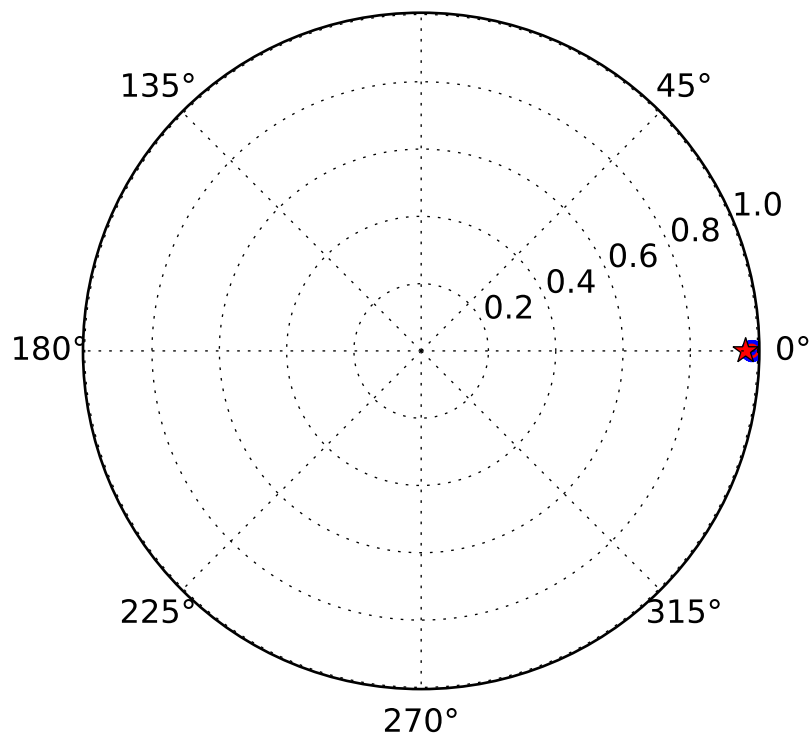
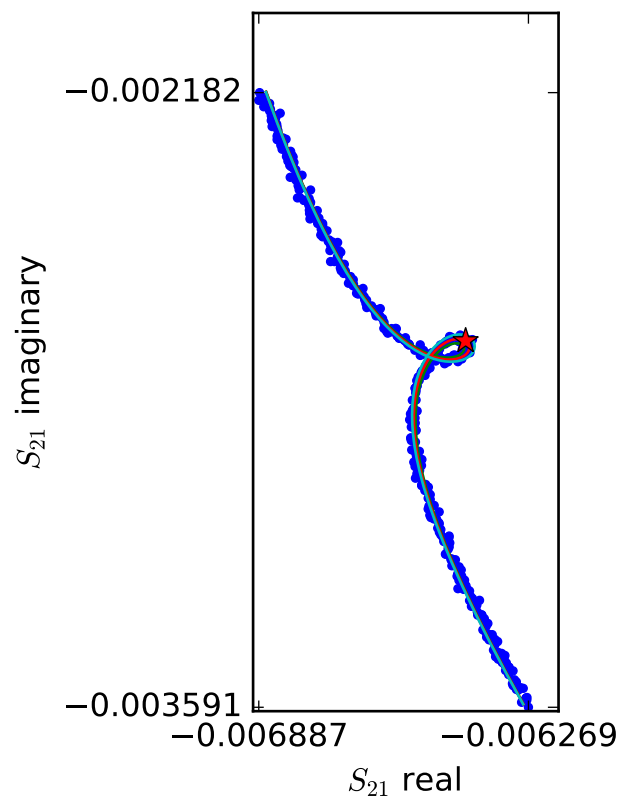
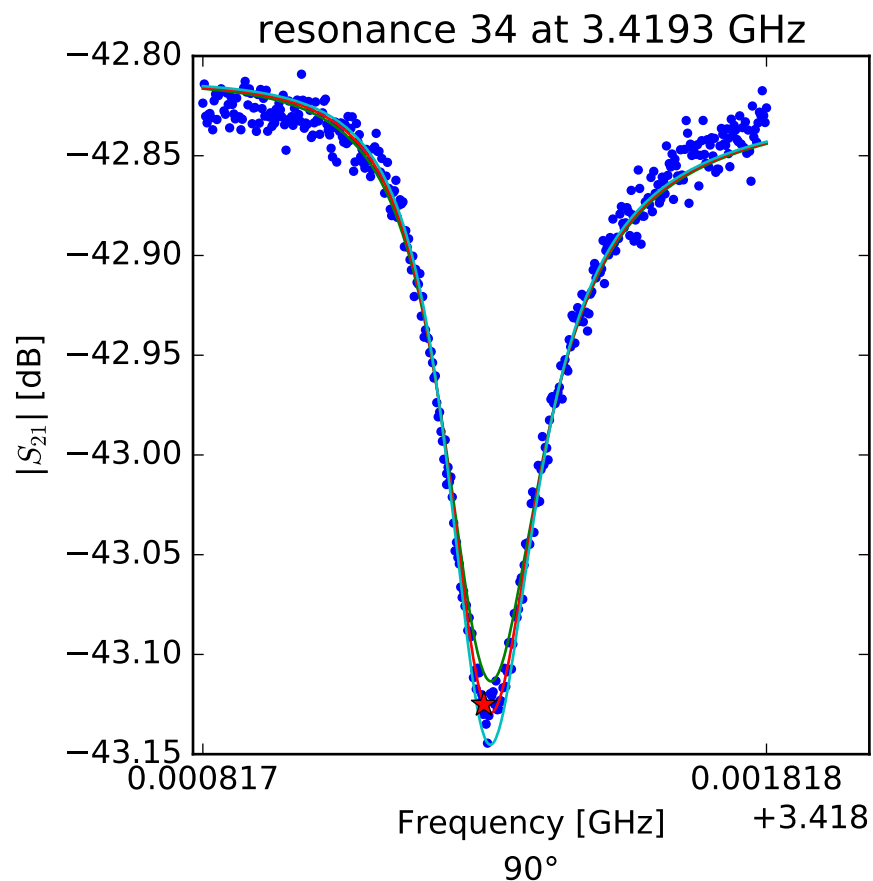
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r(\frac{f-f_r}{f_r})} \right]$$

$$\begin{aligned} f_r &= 3.40289031819 \\ Q_r &= 8457.10186655 \\ Q_c &= 295236.6772 \\ a &= (0.008456712197 + 0.00081465155823j) \\ \phi_0 &= 0.943755336507 \\ \tau &= 38.7459334258 \end{aligned}$$



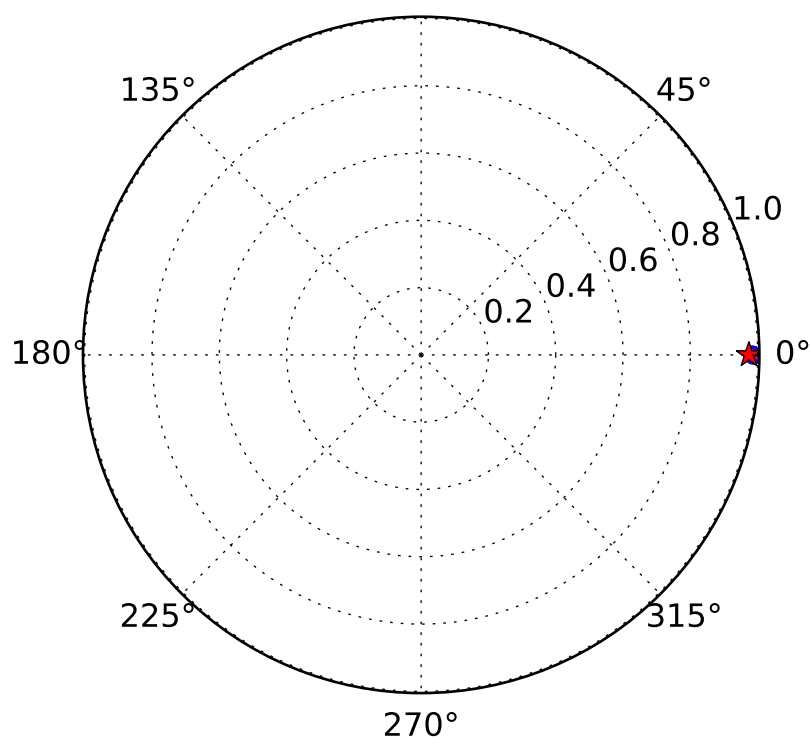
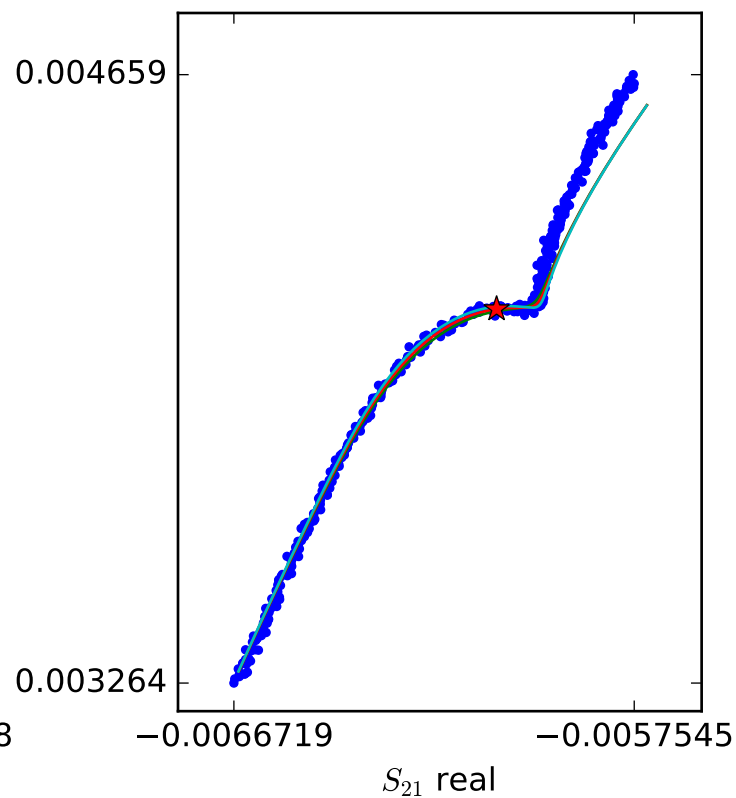
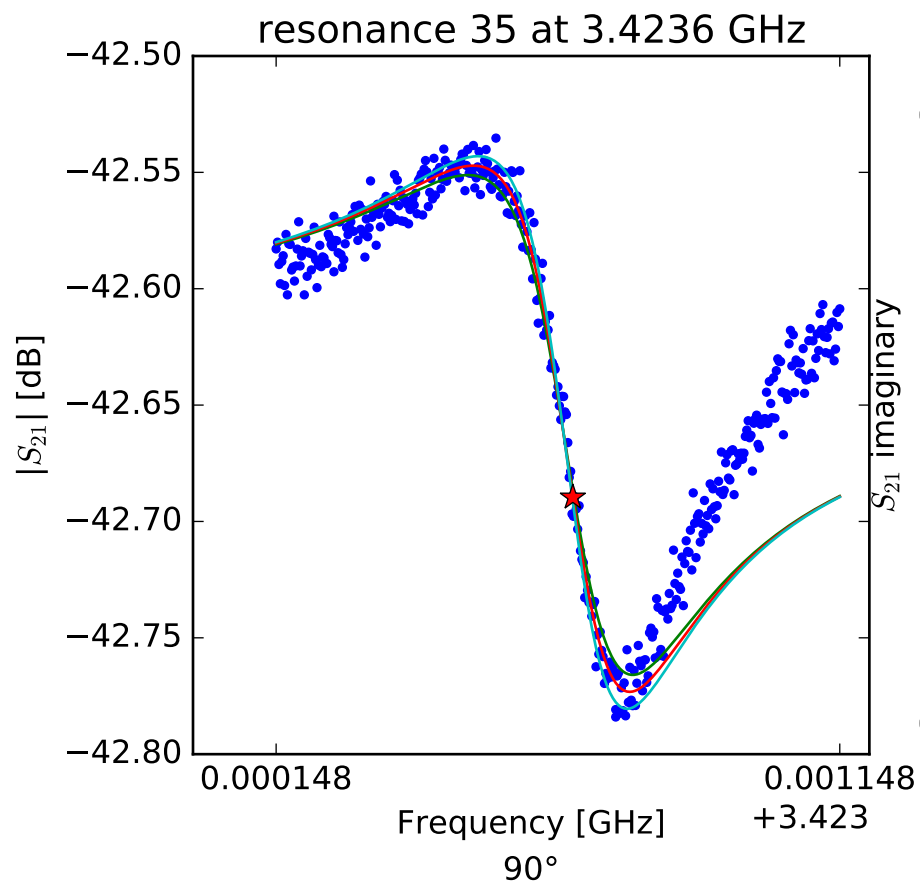
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.41554648075 \\ Q_r &= 10772.3725242 \\ Q_c &= 197750.961452 \\ a &= (0.00645606283663 + 0.00333856341684j) \\ \phi_0 &= 0.989762025438 \\ \tau &= 35.8290019715 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.41931612392 \\ Q_r &= 16444.3998949 \\ Q_c &= 459850.108717 \\ a &= (0.00671892481538 + 0.00266993360195j) \\ \phi_0 &= 0.226482067559 \\ \tau &= 35.8242311336 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.42367388913$$

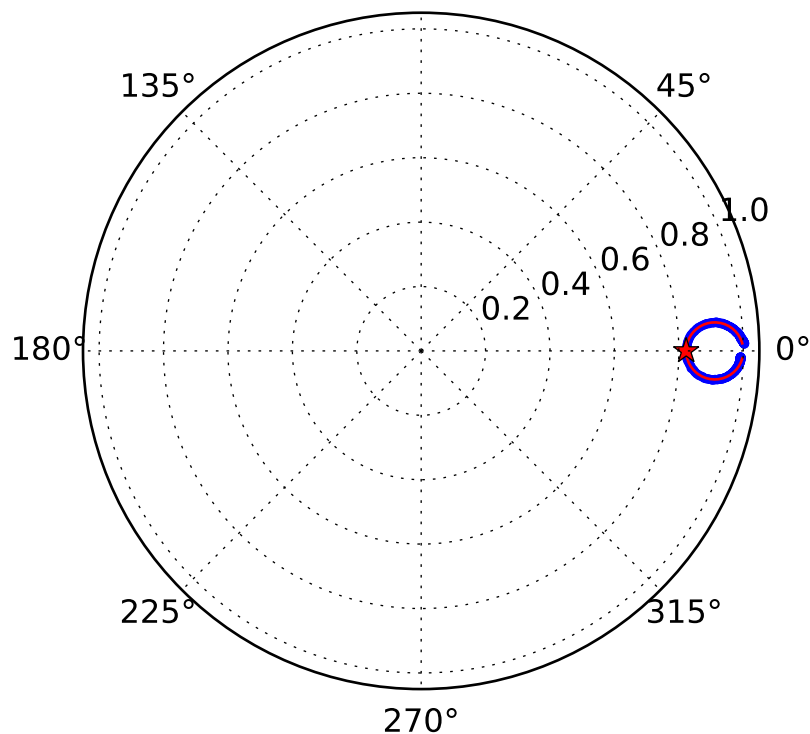
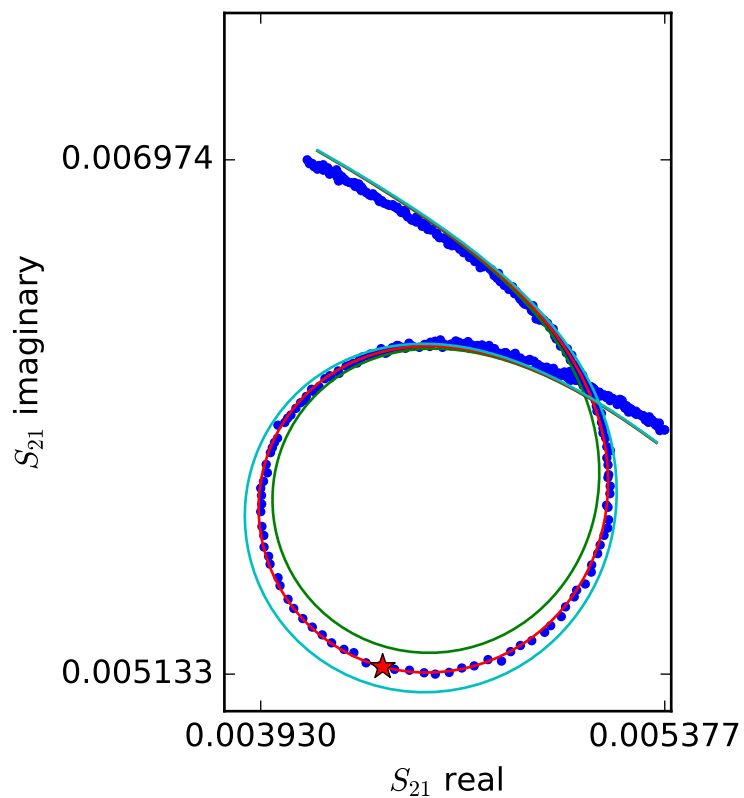
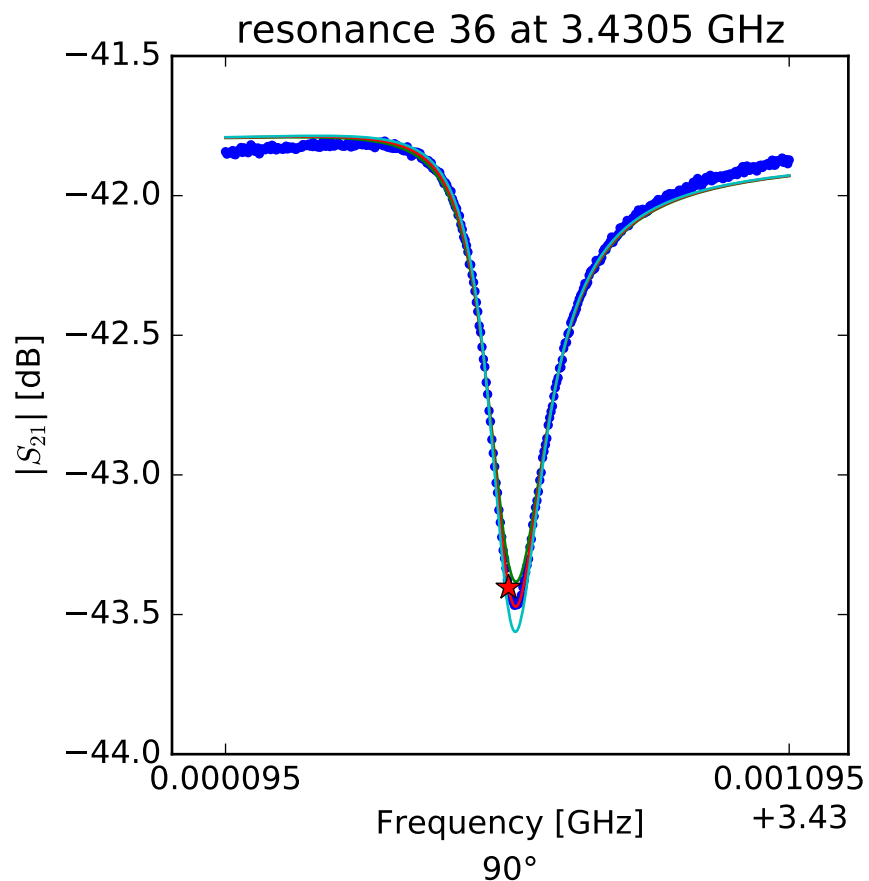
$$Q_r = 12818.380241$$

$$Q_c = 494210.027776$$

$$a = (-0.000714858392513 + 0.00735460405099j)$$

$$\phi_0 = 1.28213116898$$

$$\tau = 35.0081162985$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.43059712353$$

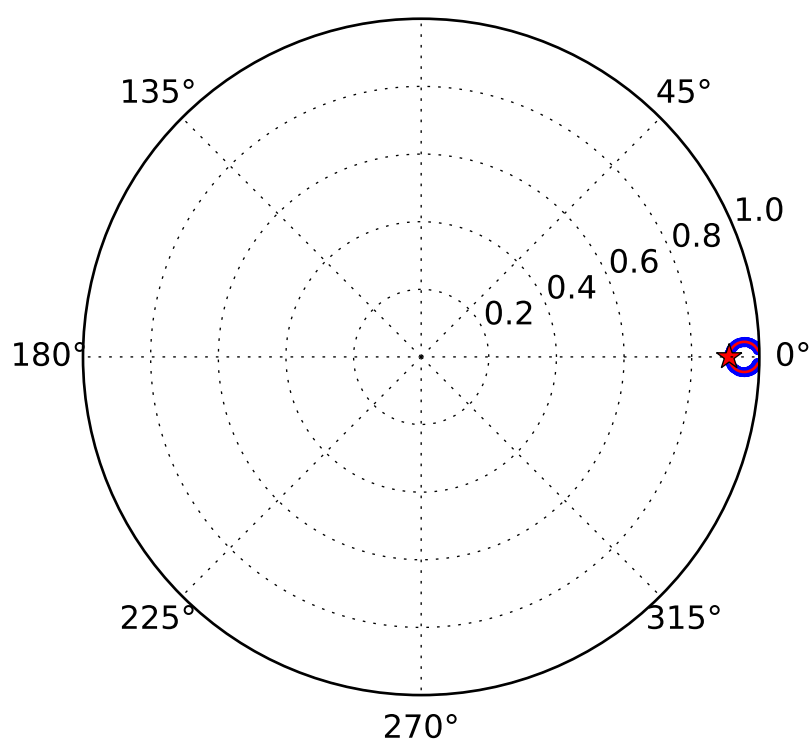
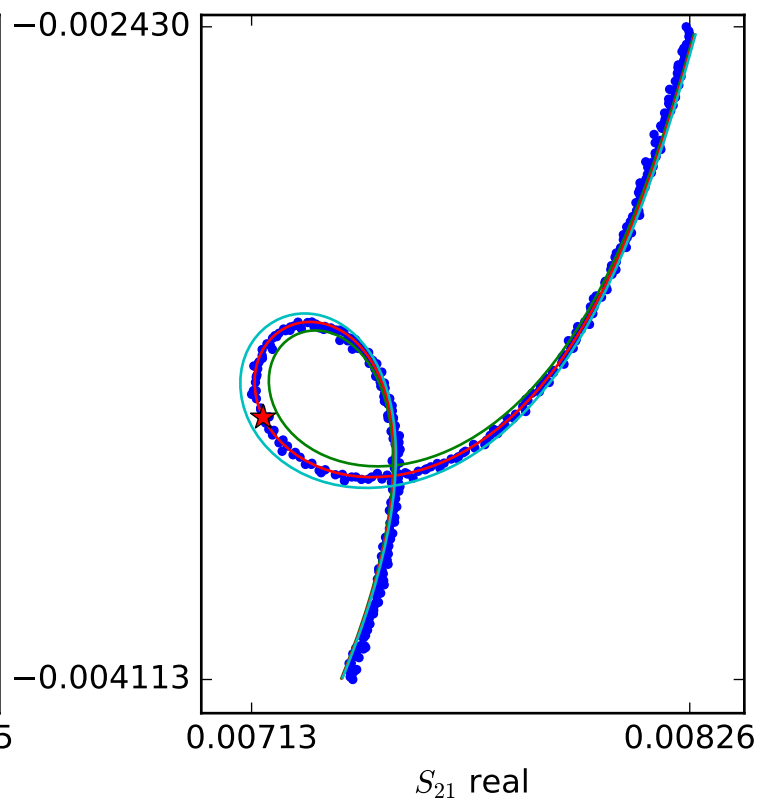
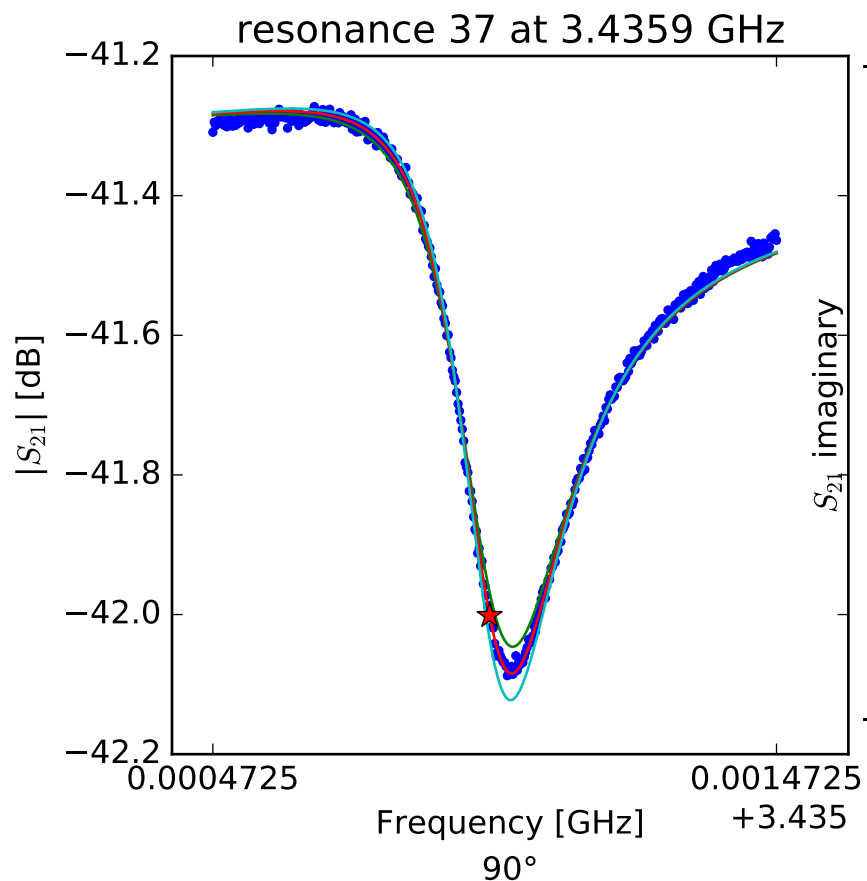
$$Q_r = 25495.8135106$$

$$Q_c = 143872.762857$$

$$a = (-0.00799033678119 + 0.00129457302008j)$$

$$\phi_0 = 0.339264628952$$

$$\tau = 38.5719965468$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.43596348073$$

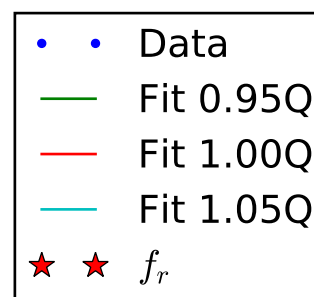
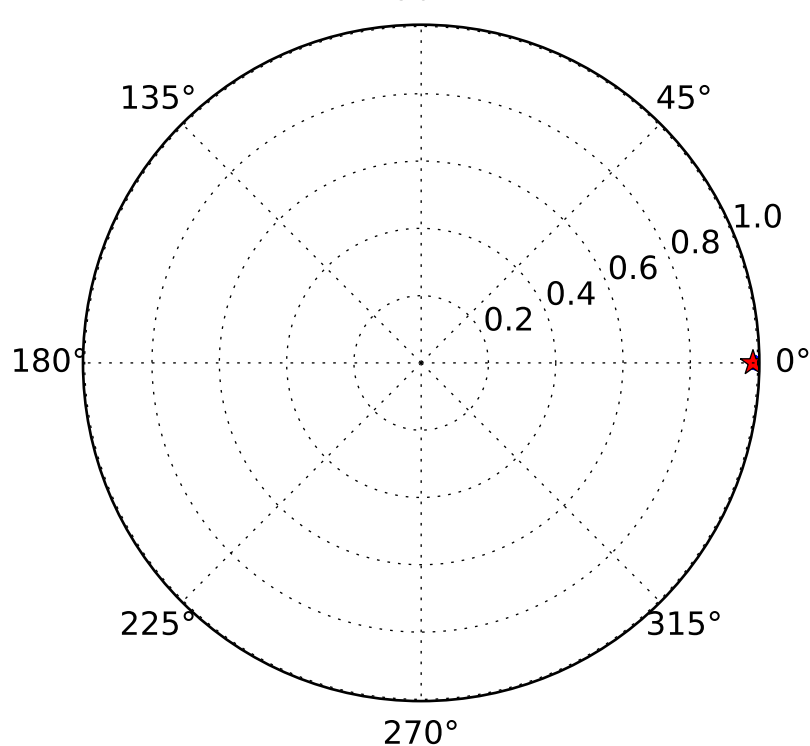
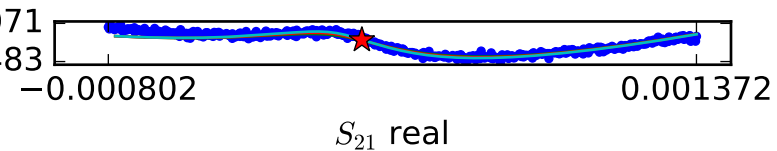
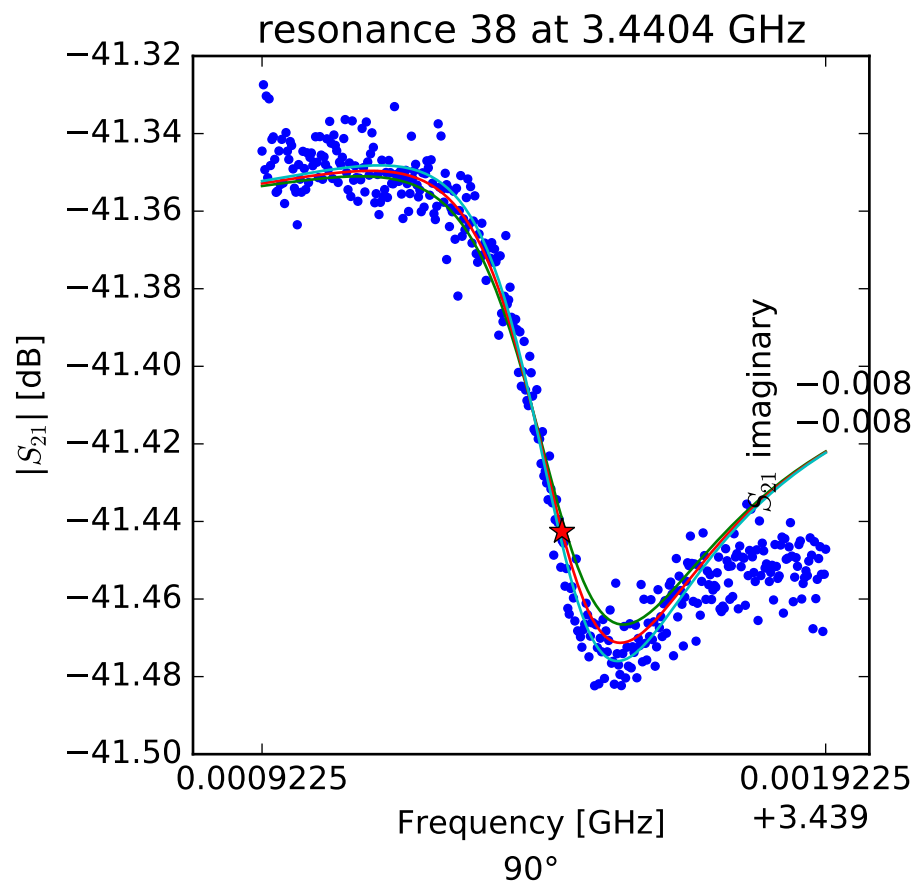
$$Q_r = 14207.214132$$

$$Q_c = 159133.358186$$

$$a = (-0.00621332597245 + 0.00589038719713j)$$

$$\phi_0 = 0.598480129102$$

$$\tau = 40.5830415211$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.44045474964$$

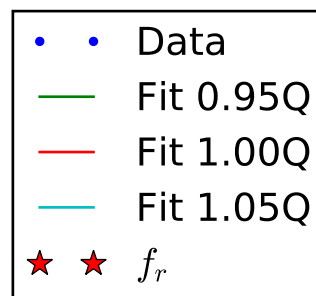
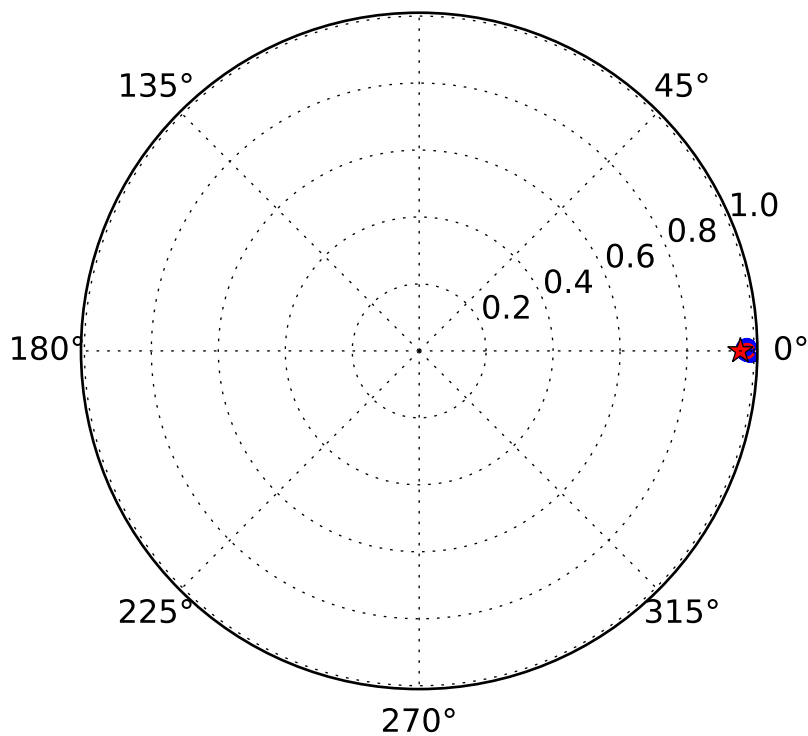
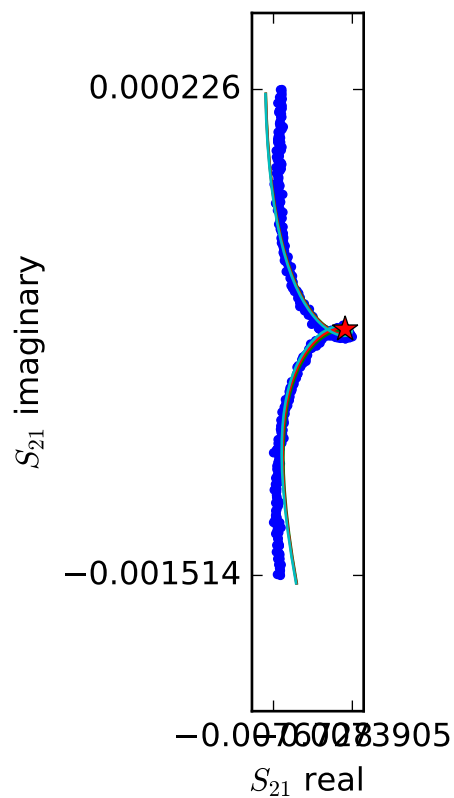
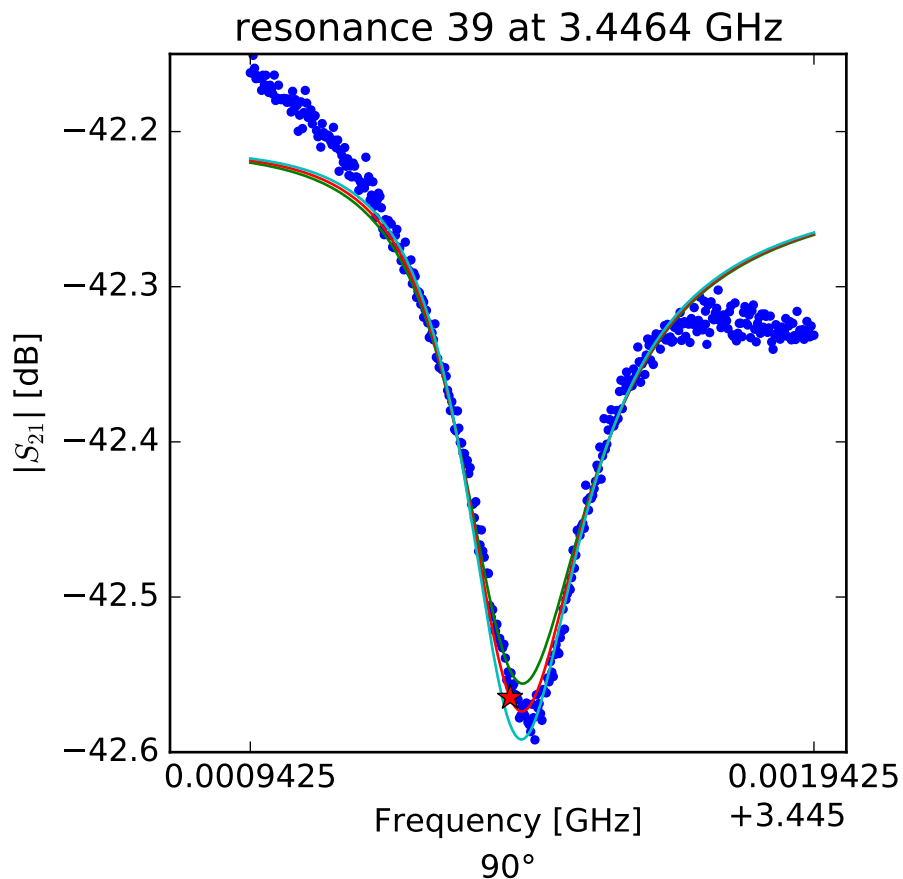
$$Q_r = 9168.07708364$$

$$Q_c = 656835.628213$$

$$a = (-0.00688809025676 - 0.00503695963671j)$$

$$\phi_0 = 1.00222514397$$

$$\tau = 40.9382088872$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.44640340978$$

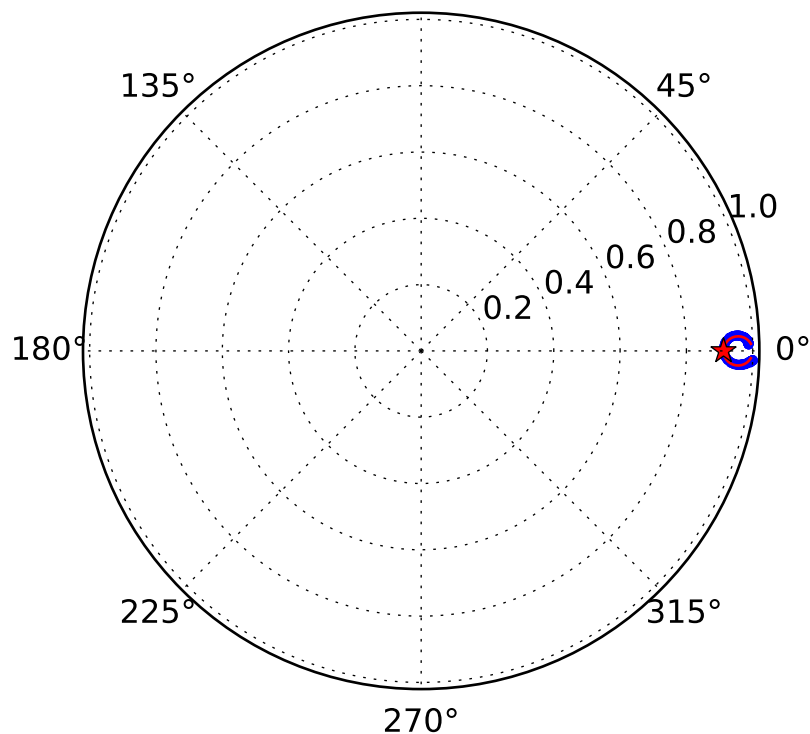
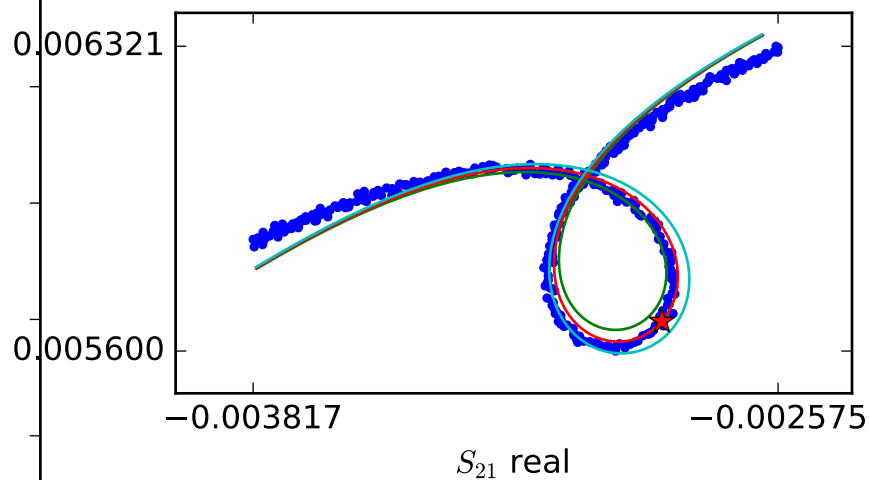
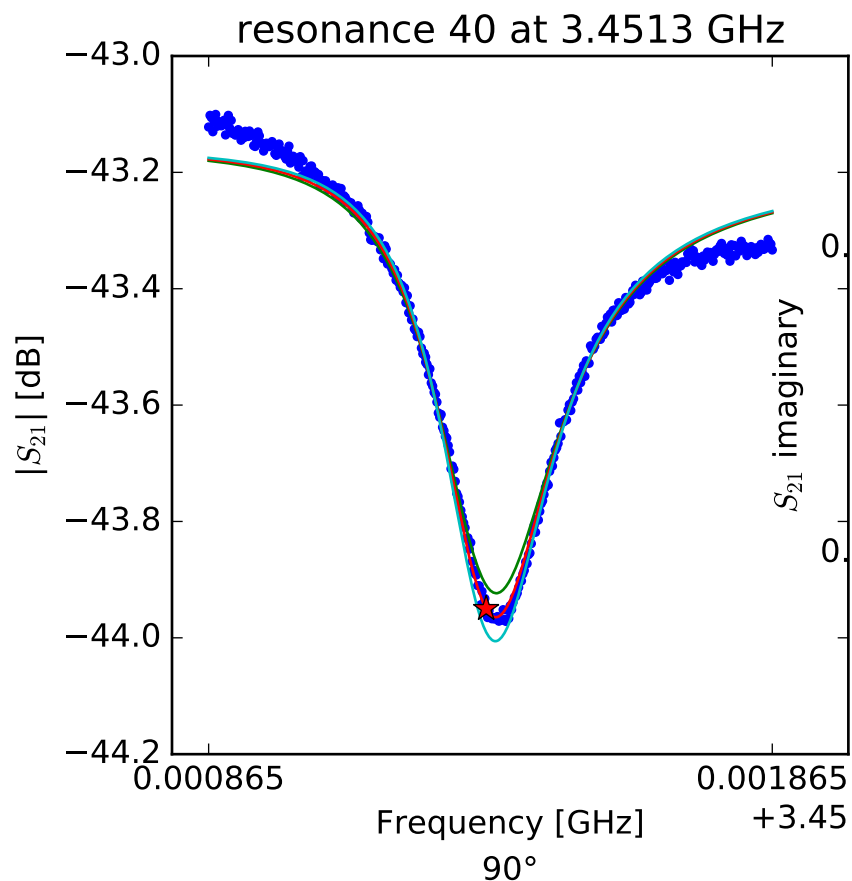
$$Q_r = 12800.891898$$

$$Q_c = 314259.476944$$

$$a = (-0.00242987902022 + 0.0073523959635j)$$

$$\phi_0 = 0.304689973277$$

$$\tau = 39.3991154788$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.45135739489$$

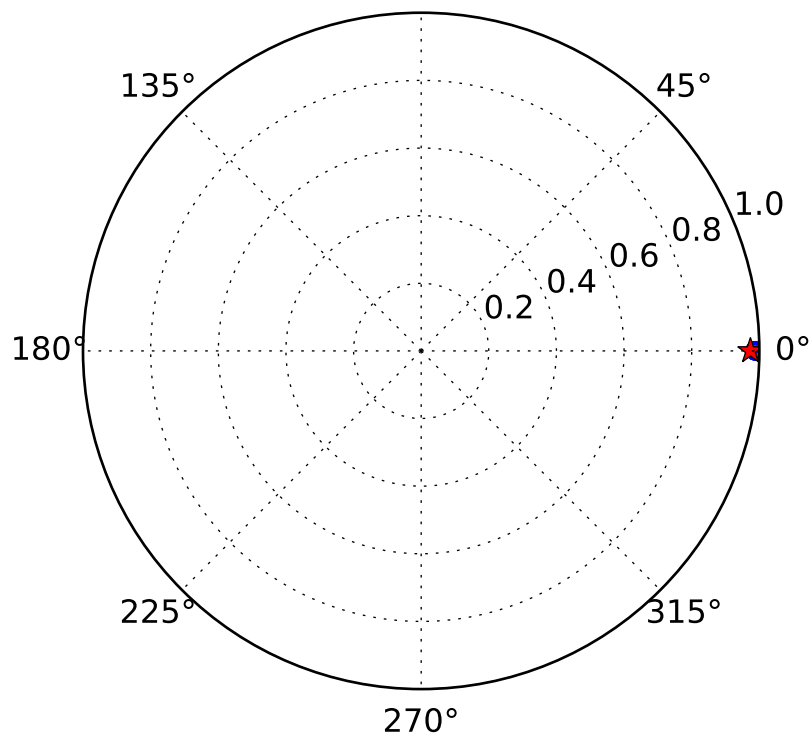
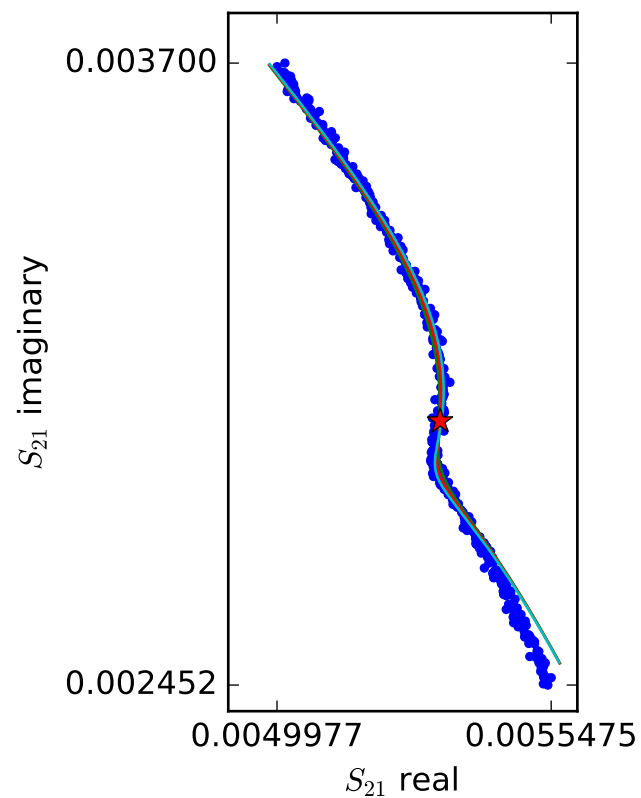
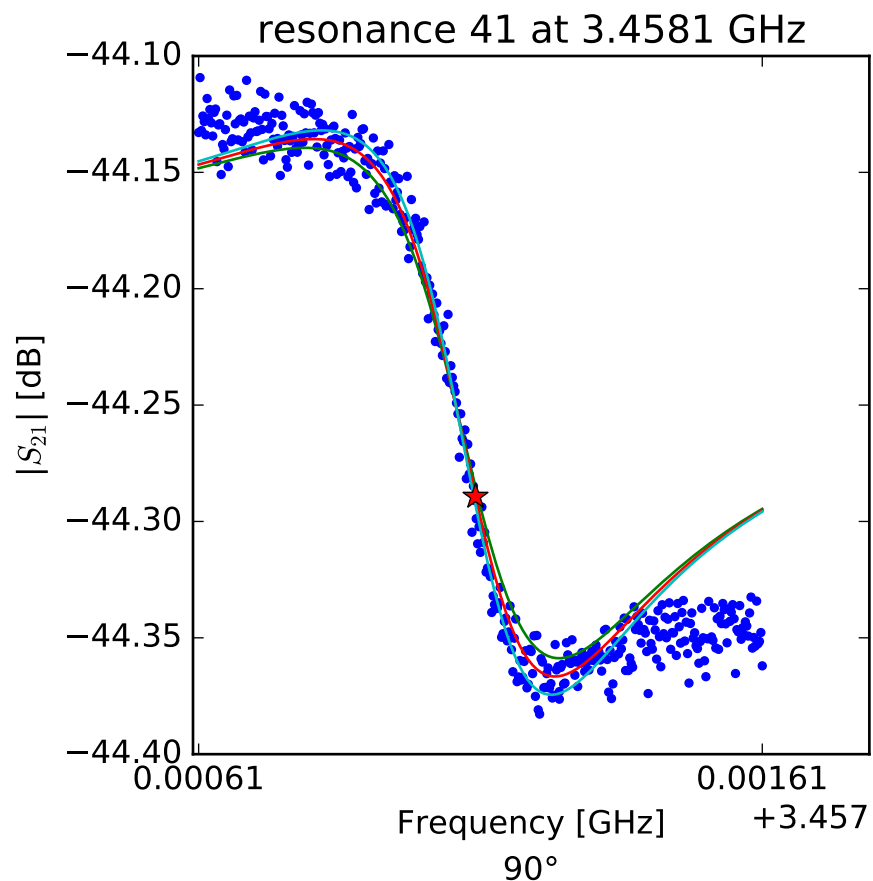
$$Q_r = 13073.2856097$$

$$Q_c = 148405.166735$$

$$a = (-0.00646011502752 - 0.0025269484787j)$$

$$\phi_0 = 0.247241519216$$

$$\tau = 37.1539240958$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.45810121449$$

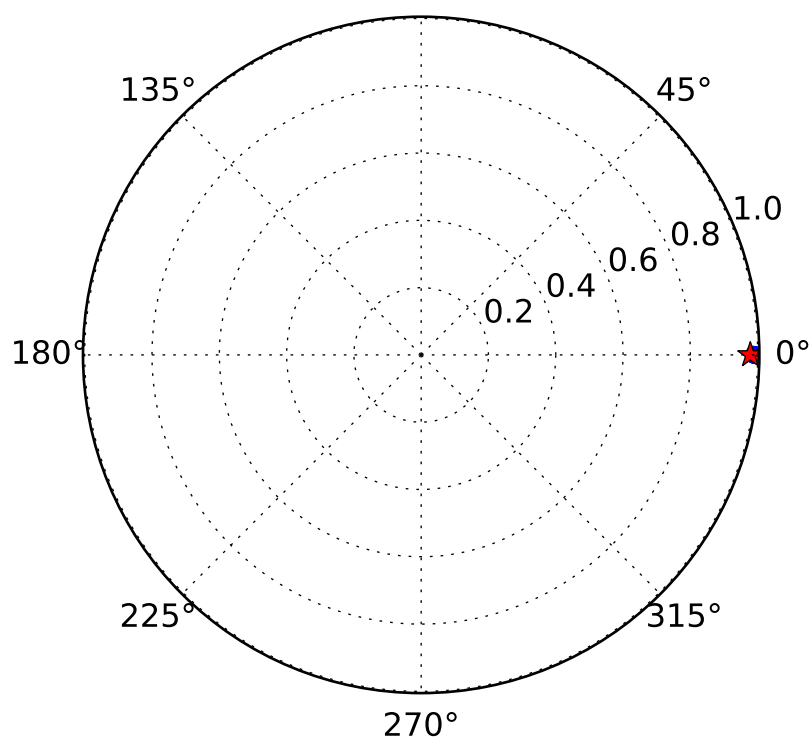
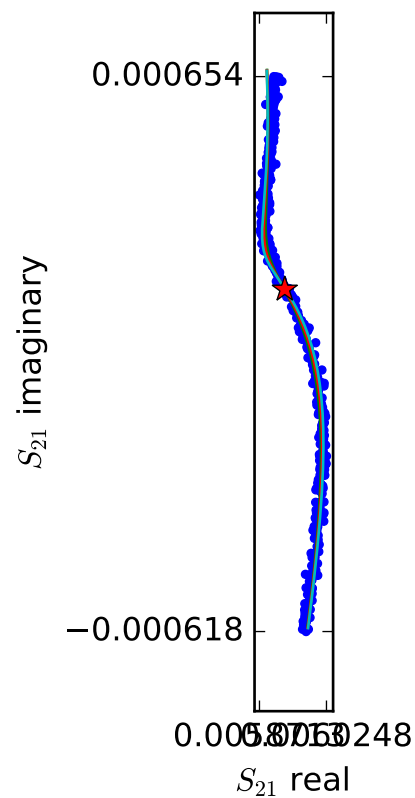
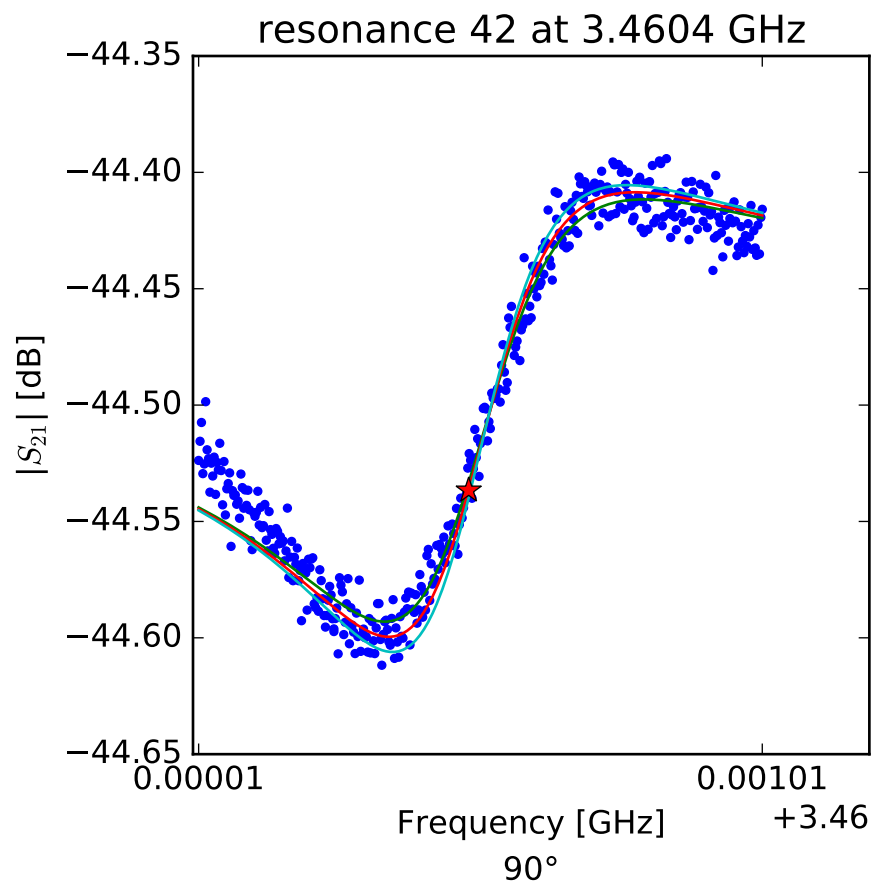
$$Q_r = 8597.58207636$$

$$Q_c = 324884.313495$$

$$a = (0.00423782990741 - 0.00446868334067j)$$

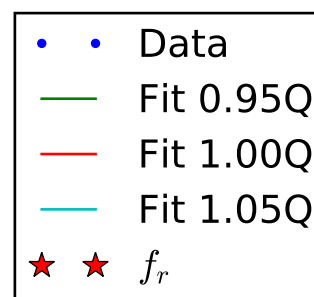
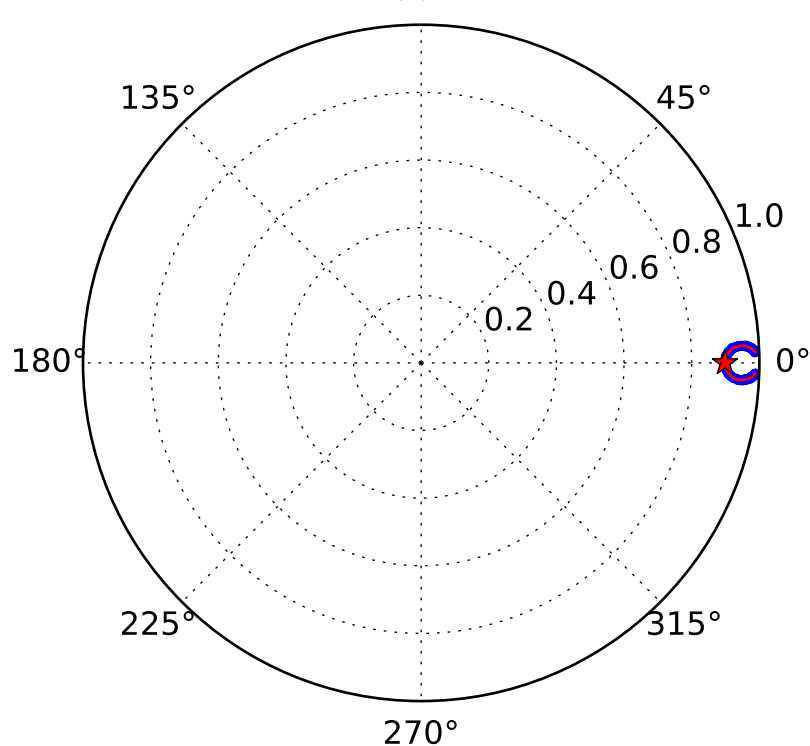
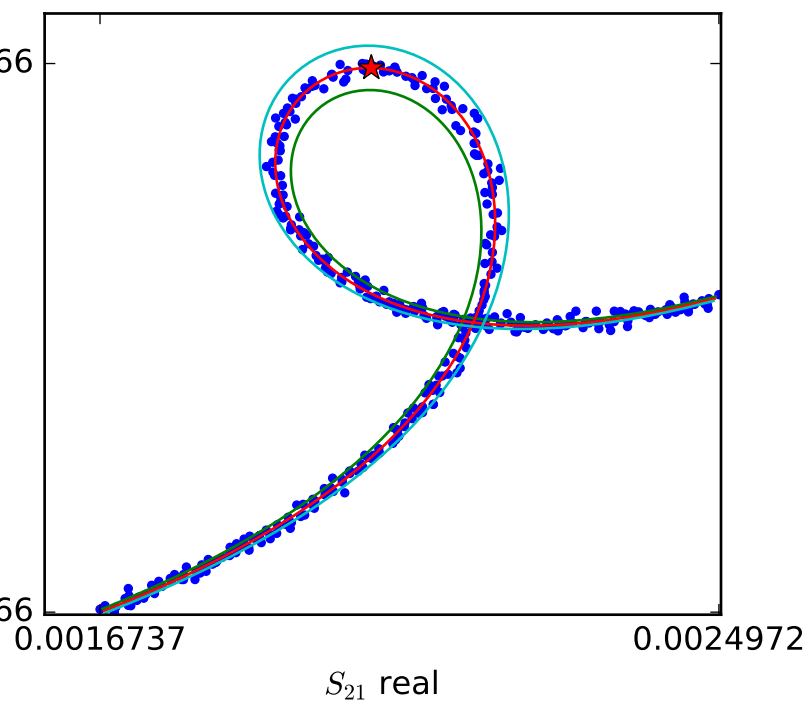
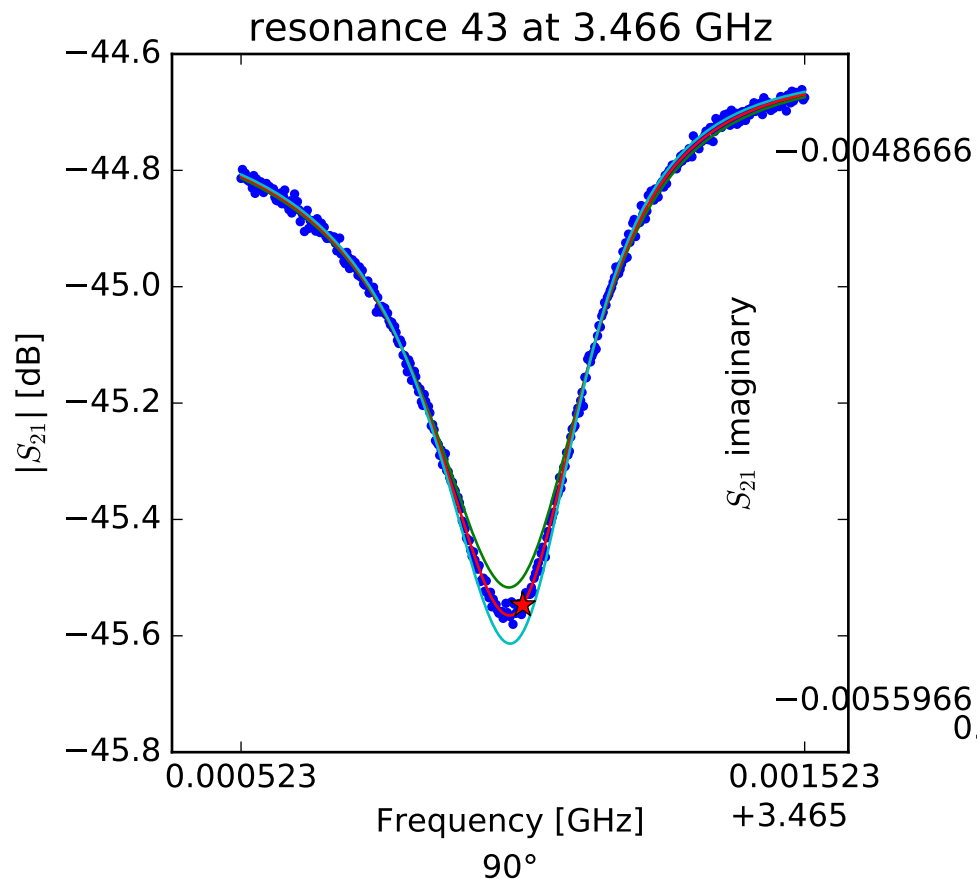
$$\phi_0 = 1.20964787333$$

$$\tau = 35.5066414162$$



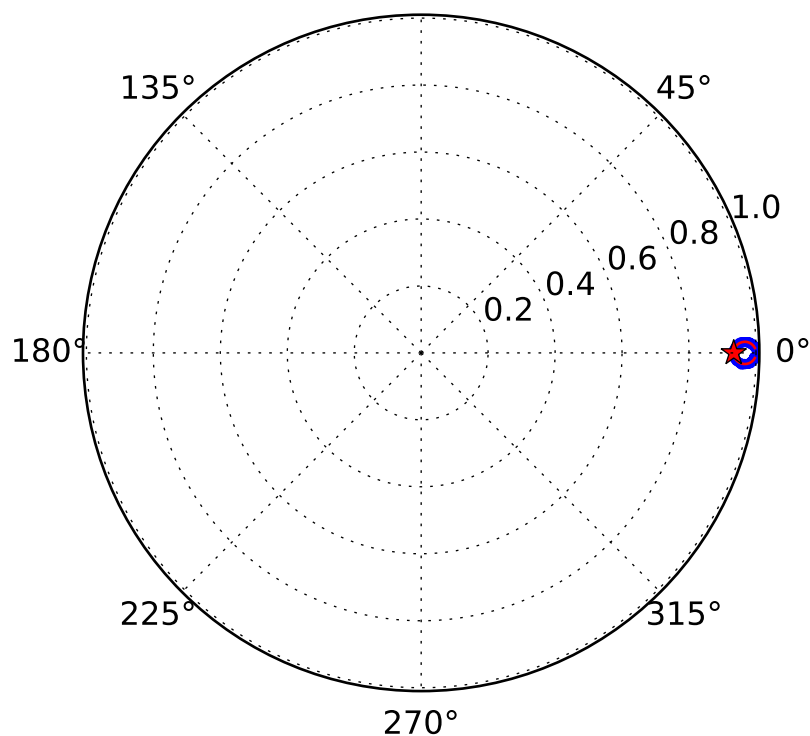
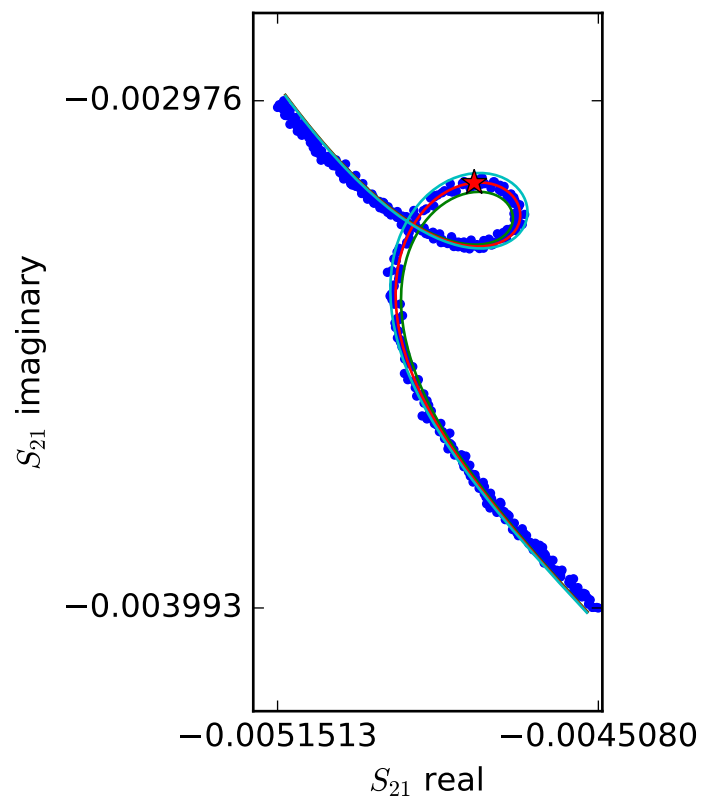
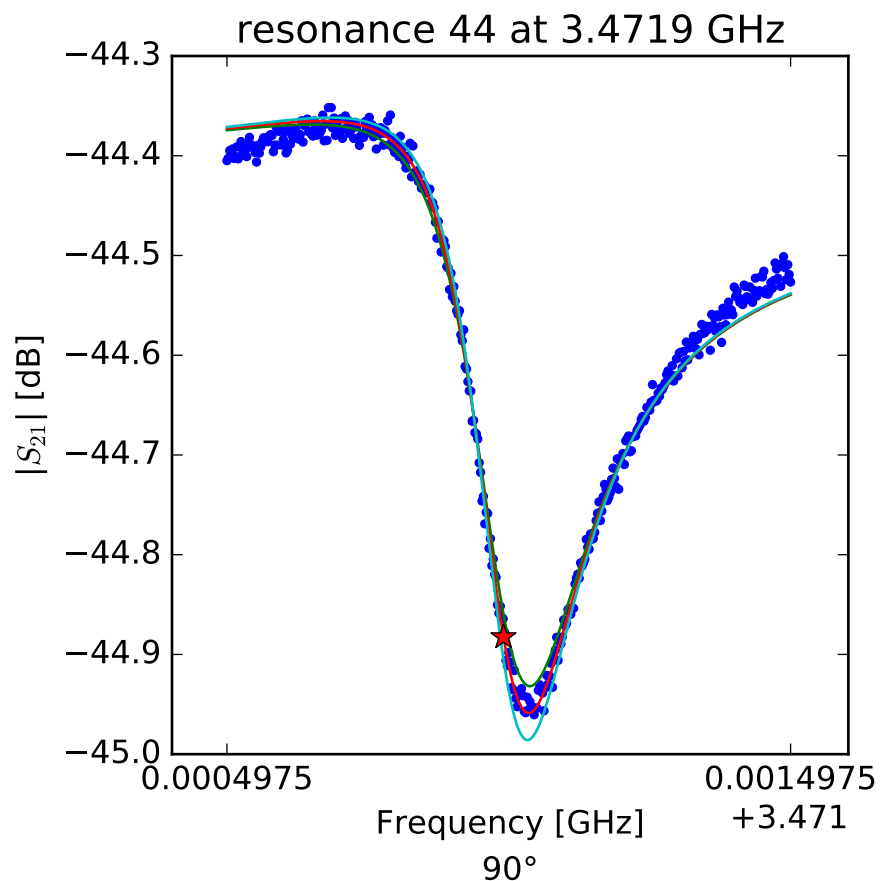
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.46048913503 \\ Q_r &= 8460.36493992 \\ Q_c &= 386177.636369 \\ a &= (0.00550585474013 - 0.00232711955148j) \\ \phi_0 &= -1.20262062459 \\ \tau &= 34.9474177844 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.46602227383 \\ Q_r &= 9871.15979193 \\ Q_c &= 97004.5377625 \\ a &= (-0.0050585989065 - 0.00294836167983j) \\ \phi_0 &= -0.251731528946 \\ \tau &= 34.8455646737 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.47198815685$$

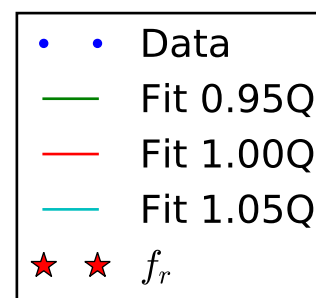
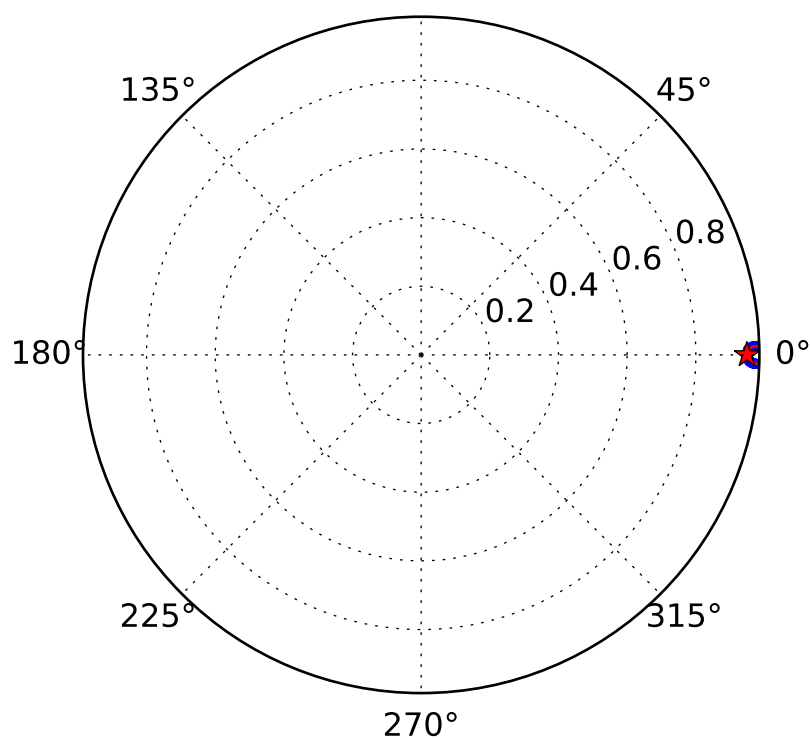
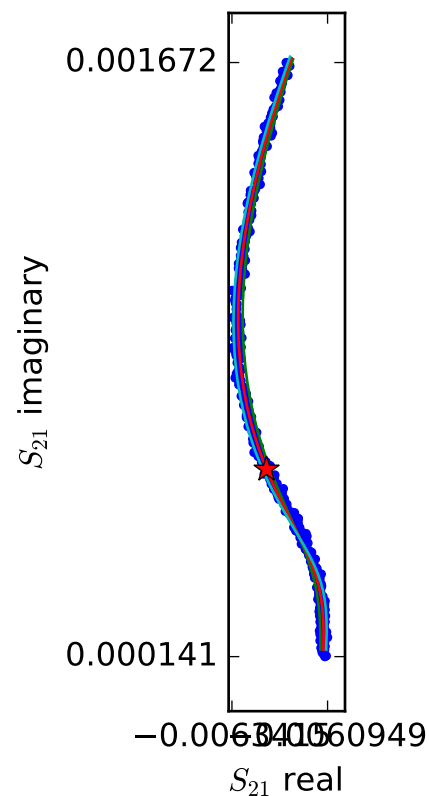
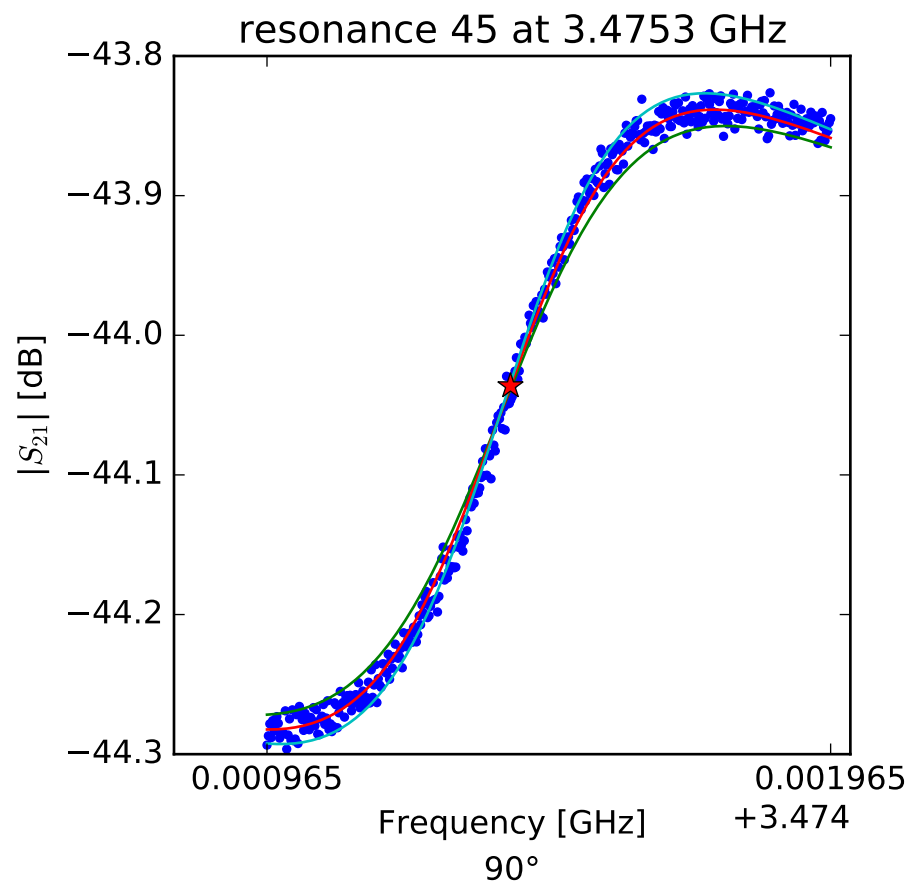
$$Q_r = 14470.3045546$$

$$Q_c = 217373.429964$$

$$a = (0.00591925455873 + 0.000997966393818j)$$

$$\phi_0 = 0.688949348595$$

$$\tau = 35.5492644022$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.47539697904$$

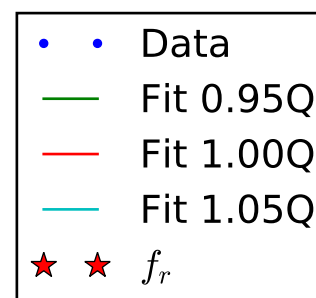
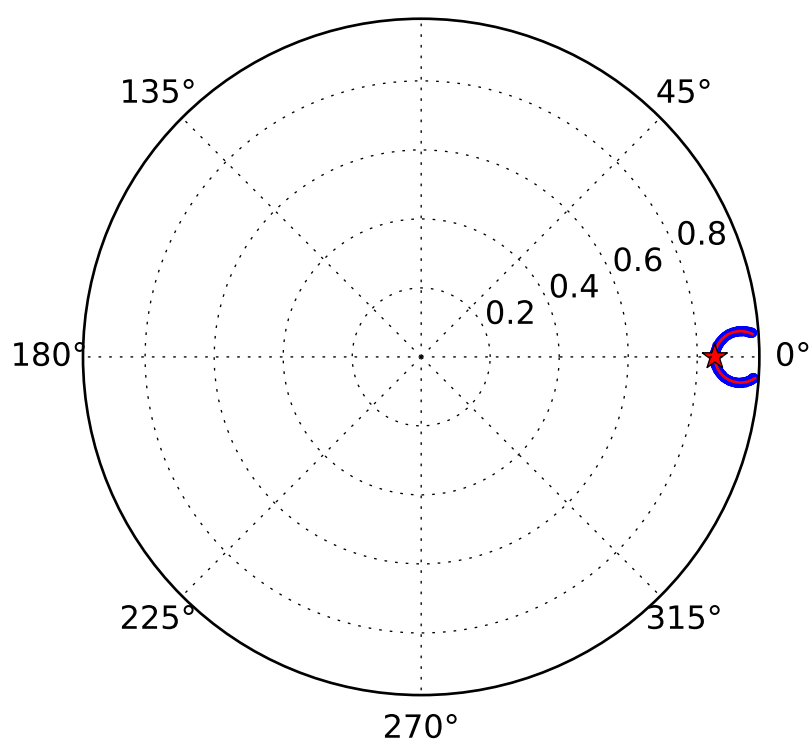
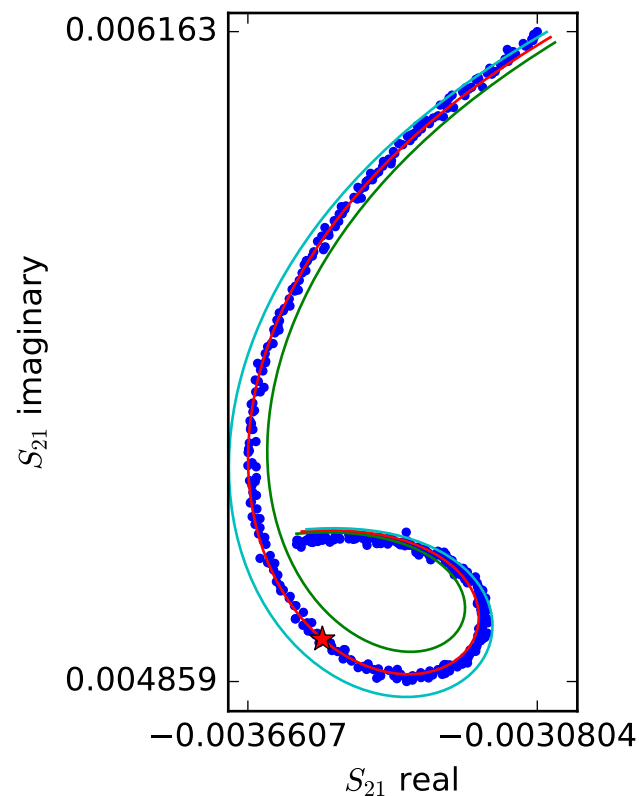
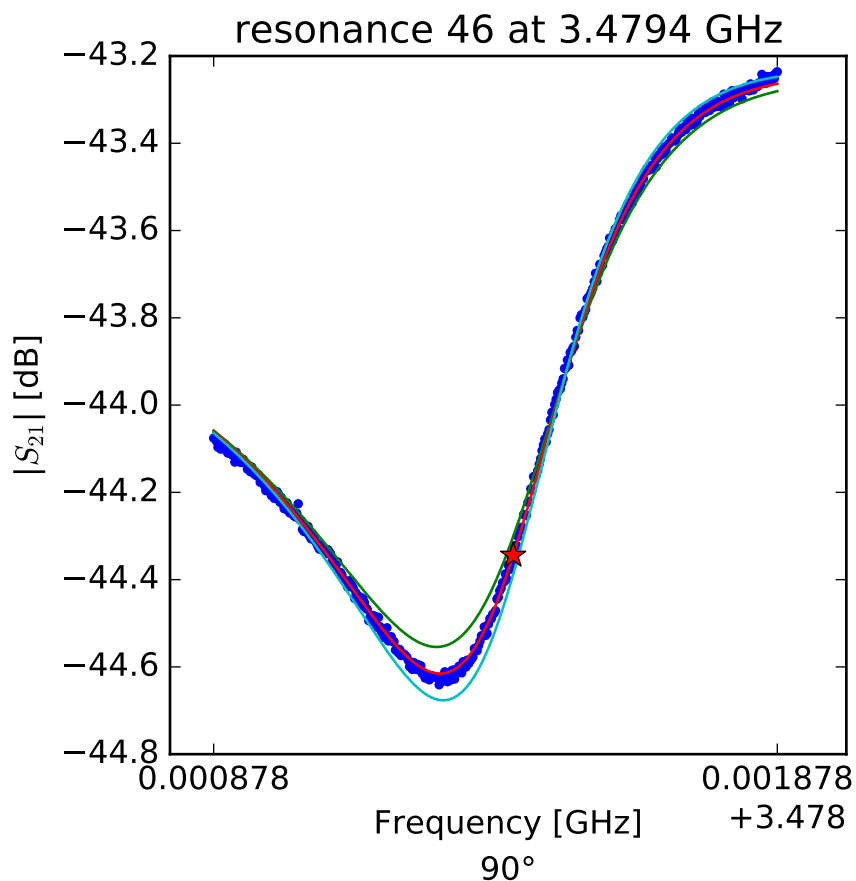
$$Q_r = 4412.10102542$$

$$Q_c = 86189.892064$$

$$a = (-0.00138013221555 + 0.00610253549097j)$$

$$\phi_0 = -1.62847069203$$

$$\tau = 36.4877228373$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.47940898672$$

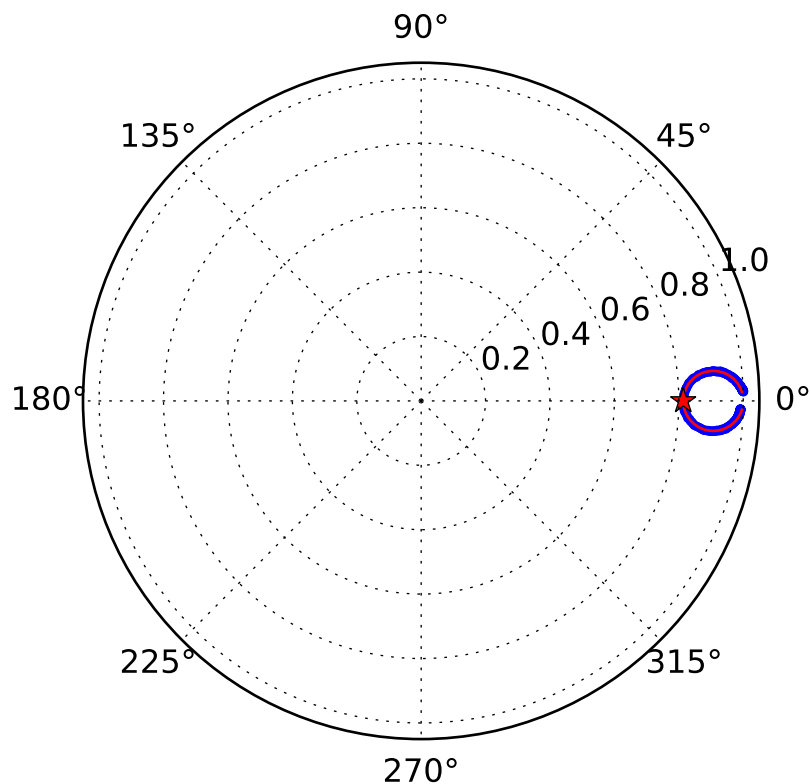
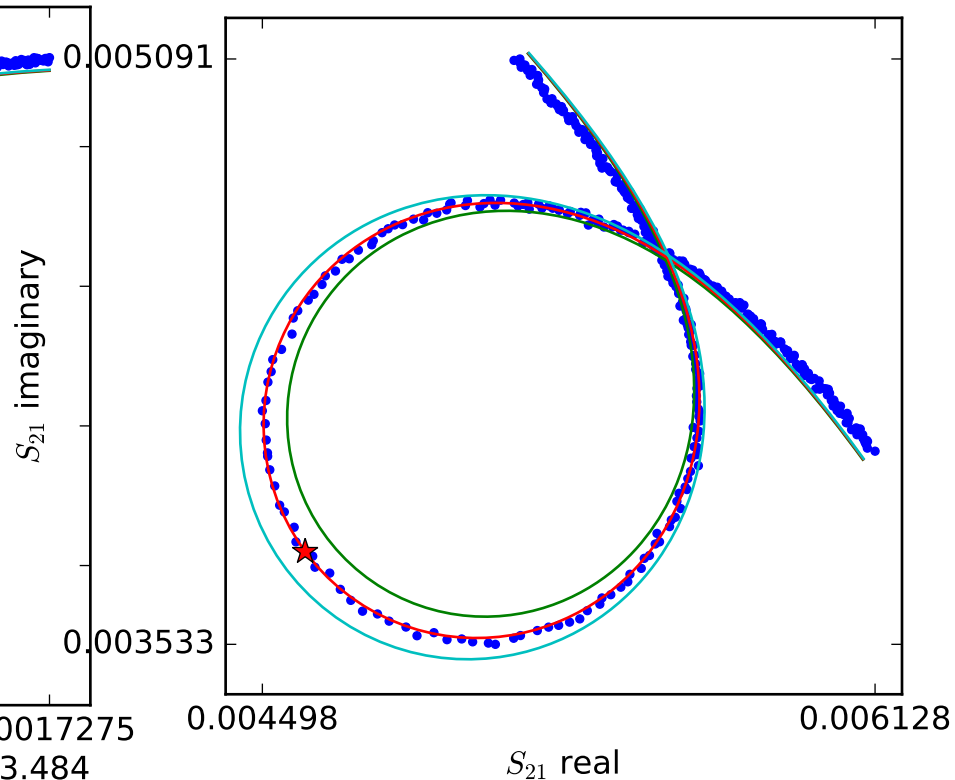
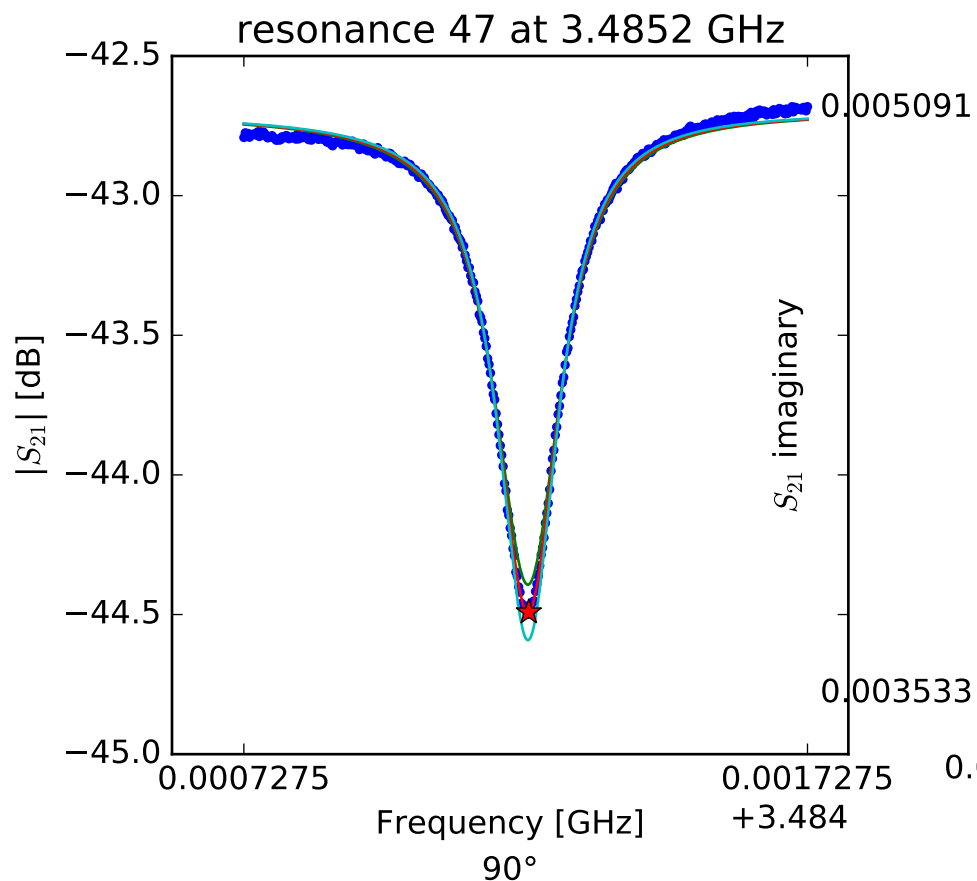
$$Q_r = 6151.75445106$$

$$Q_c = 41251.6101346$$

$$a = (0.00184682942488 - 0.00645710313132j)$$

$$\phi_0 = -0.804148350433$$

$$\tau = 37.4963193833$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.48523300388$$

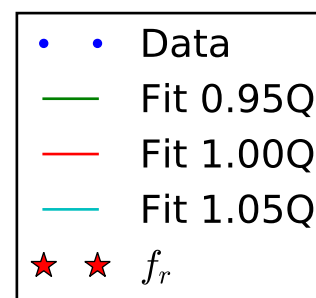
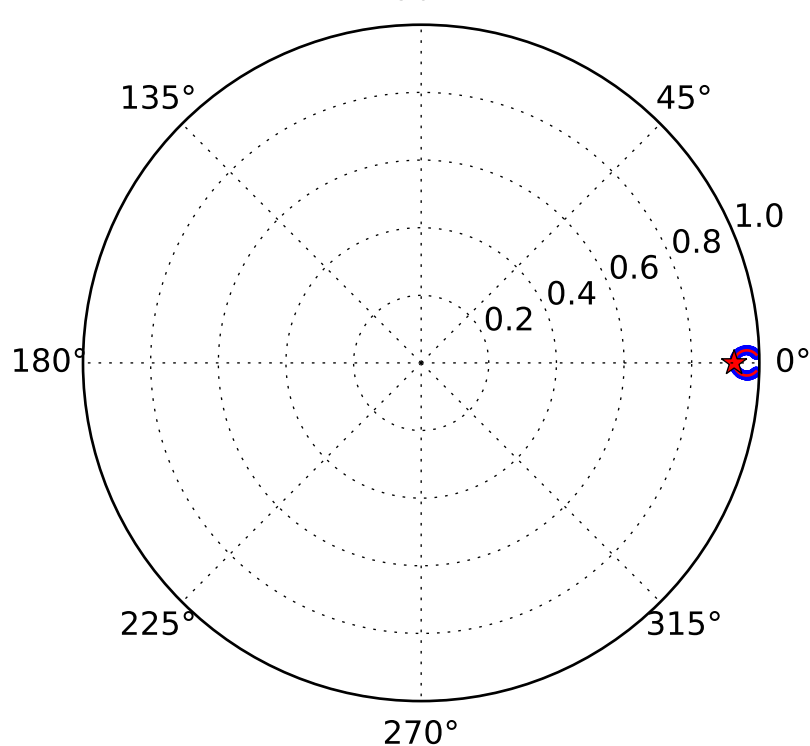
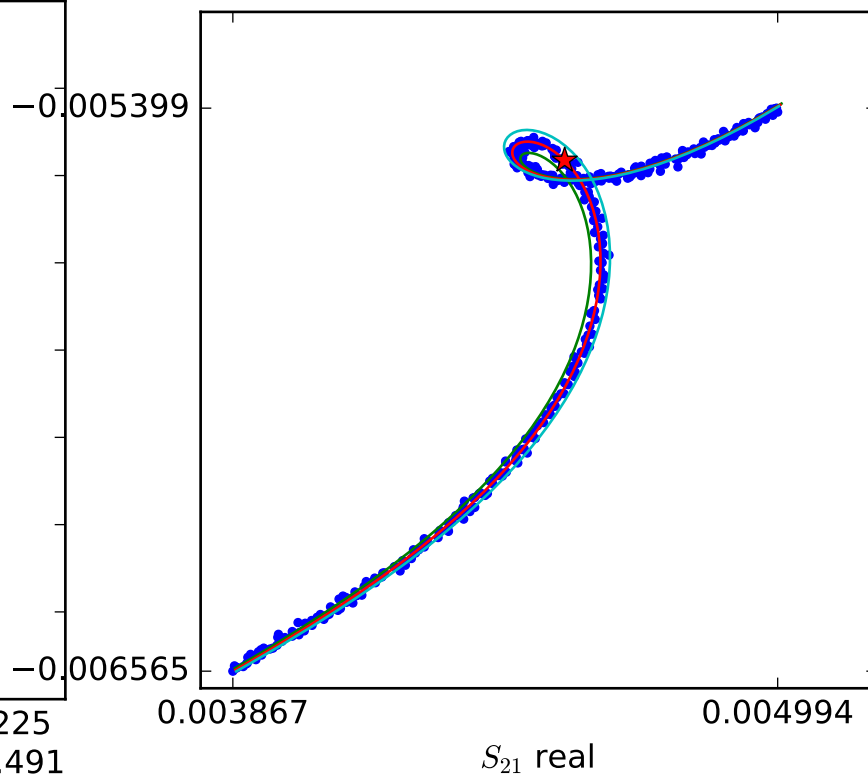
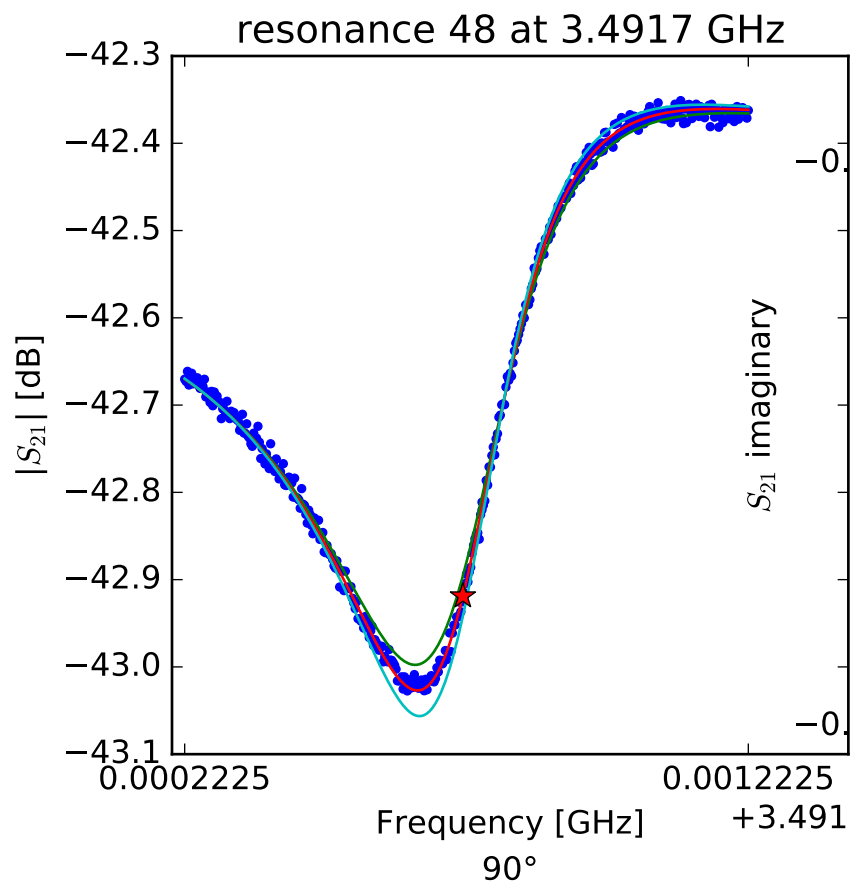
$$Q_r = 23106.9197806$$

$$Q_c = 124019.786743$$

$$a = (0.000185128894468 + 0.00732406206806j)$$

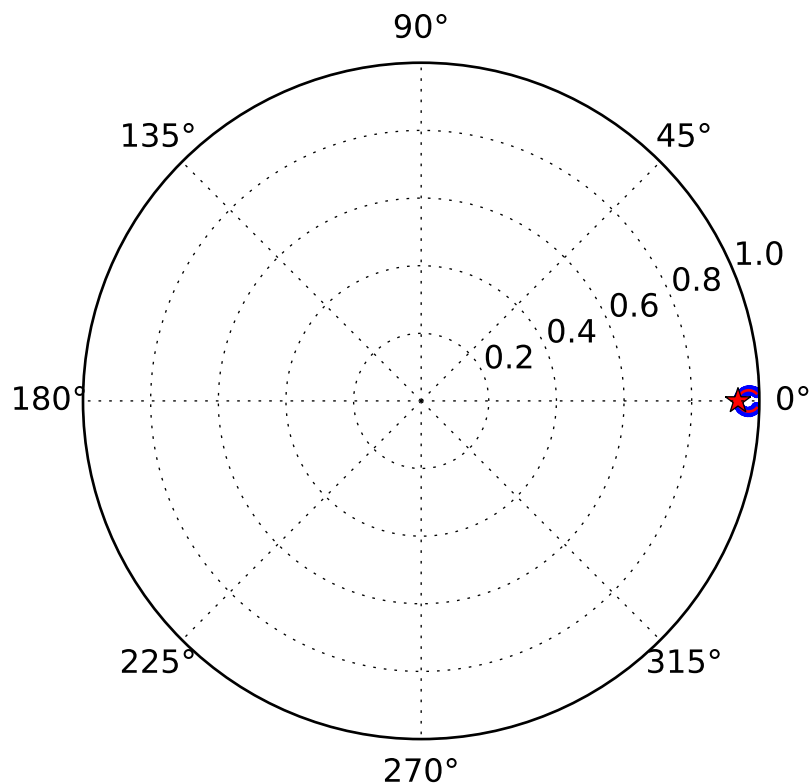
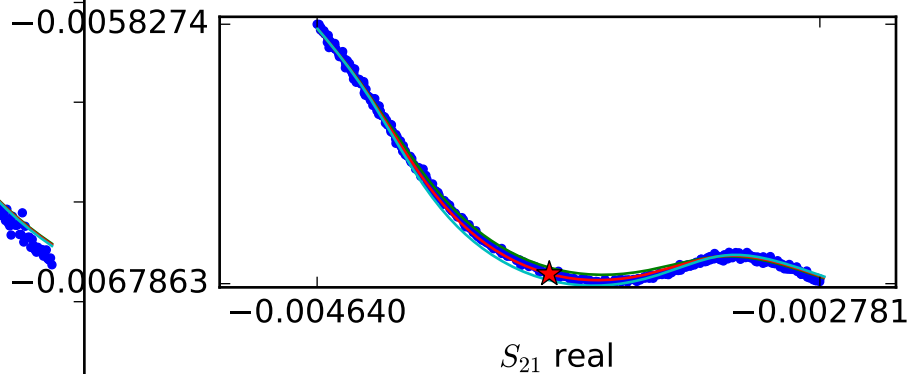
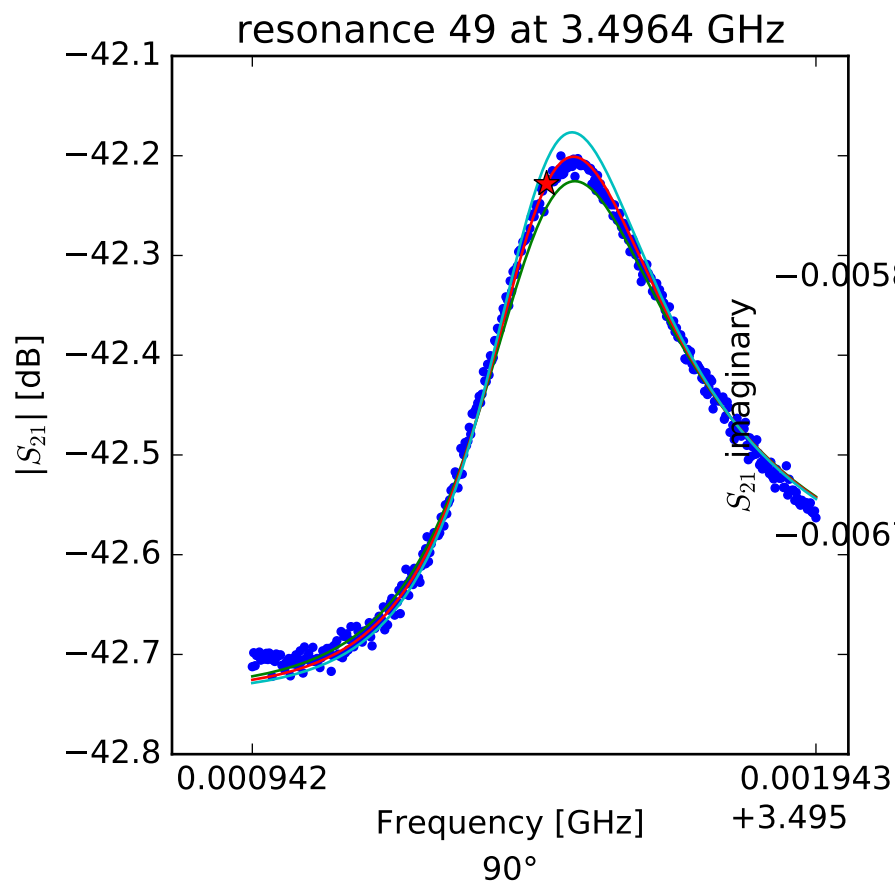
$$\phi_0 = -0.0381015087975$$

$$\tau = 39.3483293337$$



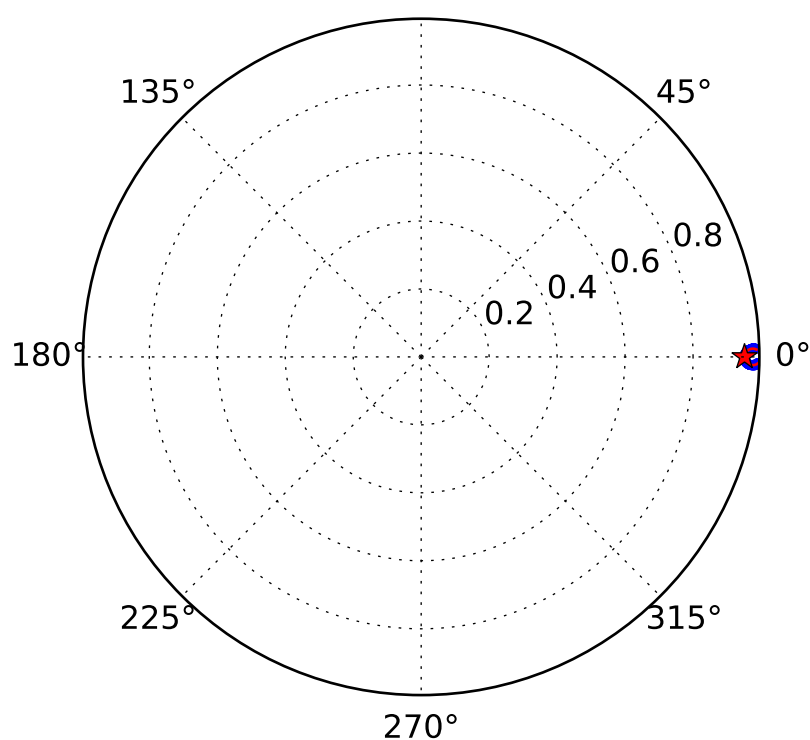
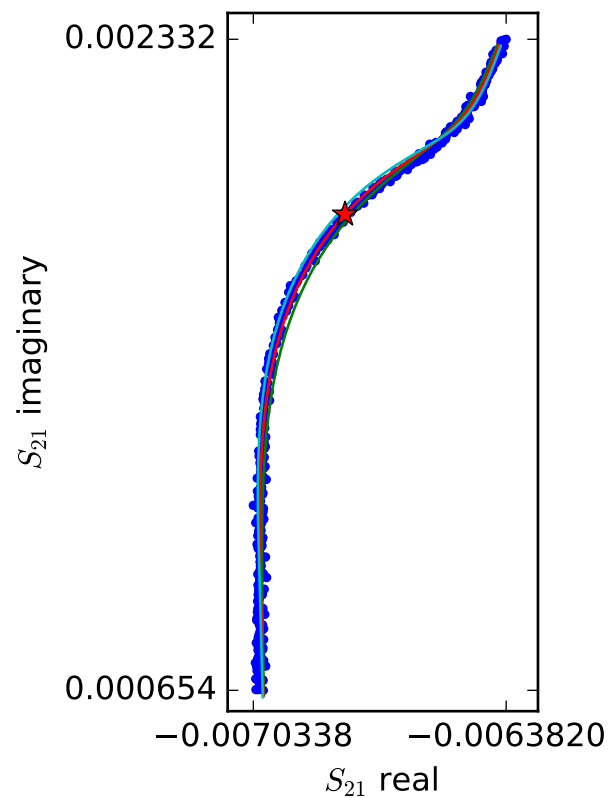
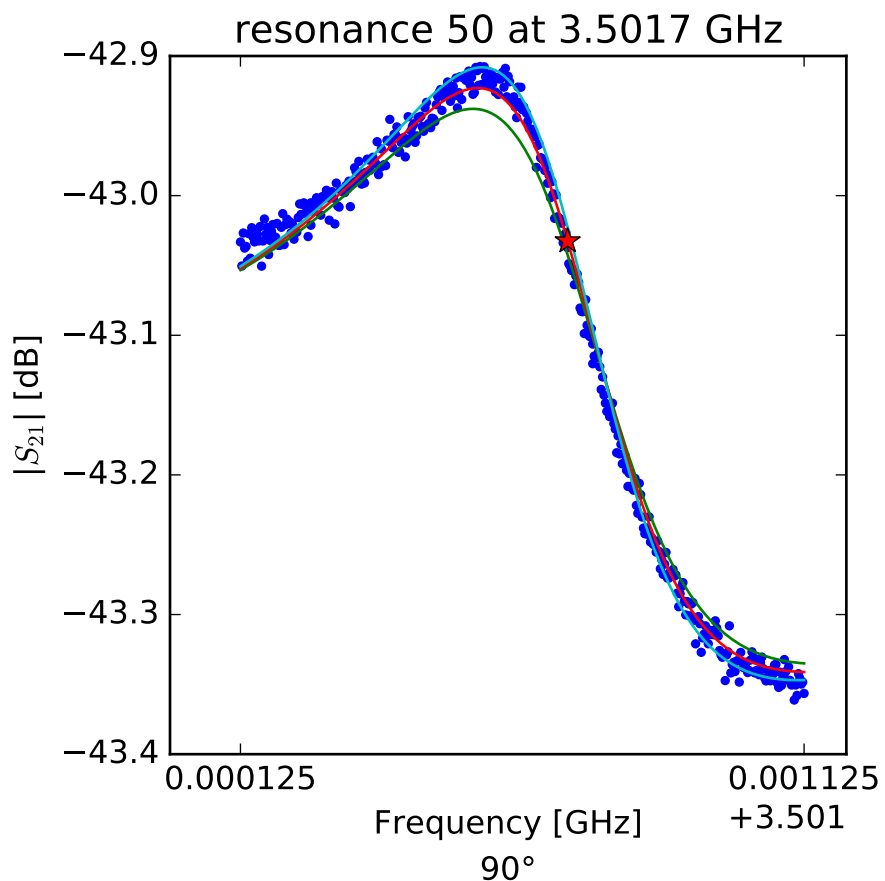
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.49171610851 \\ Q_r &= 9170.56179716 \\ Q_c &= 122826.373722 \\ a &= (-0.0053216780748 - 0.00533774594149j) \\ \phi_0 &= -0.774393104294 \\ \tau &= 39.7437959652 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.49646465192 \\ Q_r &= 8805.81850277 \\ Q_c &= 139405.890311 \\ a &= (0.00318120080559 - 0.0065977354551j) \\ \phi_0 &= -2.65860871953 \\ \tau &= 38.9413904561 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.50170552482$$

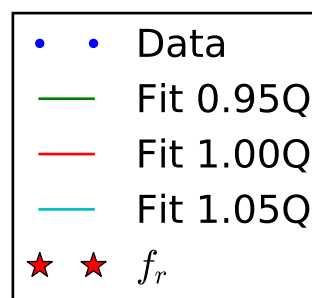
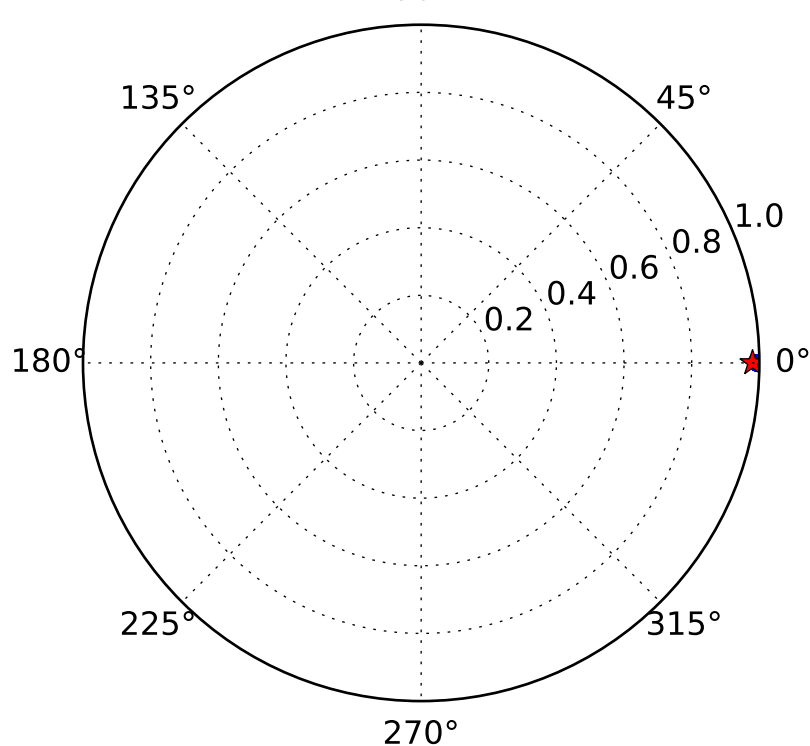
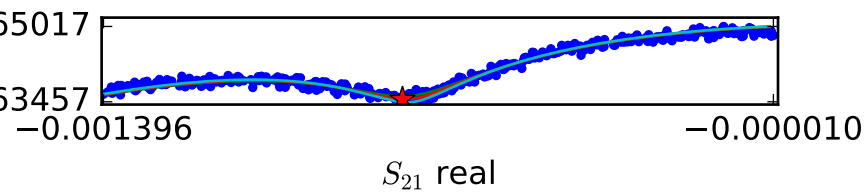
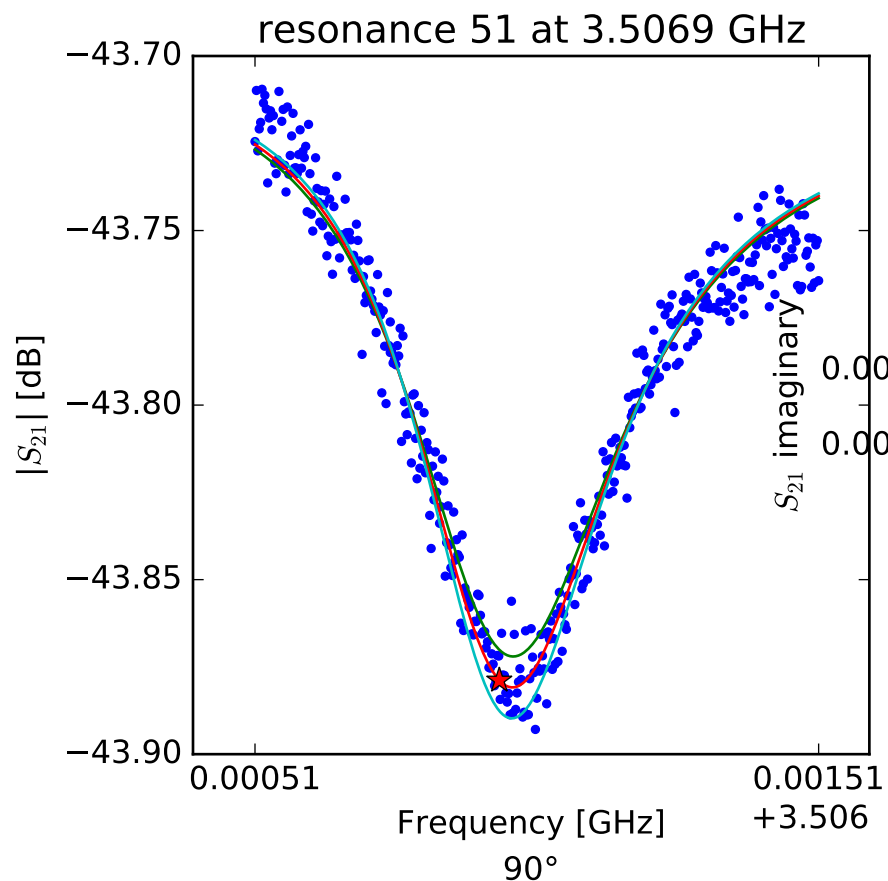
$$Q_r = 6696.94539947$$

$$Q_c = 137597.38853$$

$$a = (-0.00172466557939 - 0.00668044535665j)$$

$$\phi_0 = 2.02408058653$$

$$\tau = 37.1950012091$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.50694348372$$

$$Q_r = 8000.59552705$$

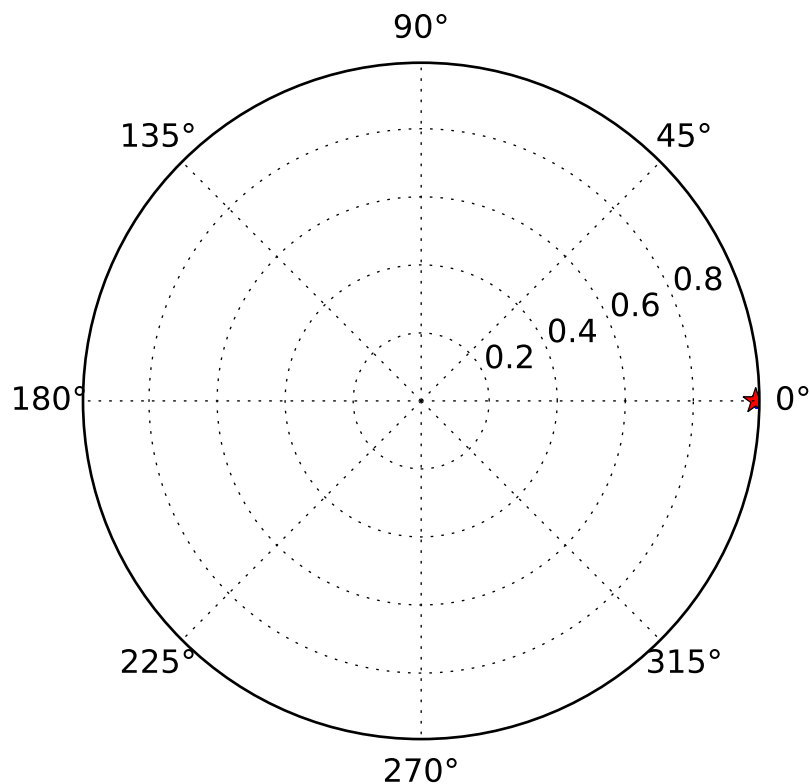
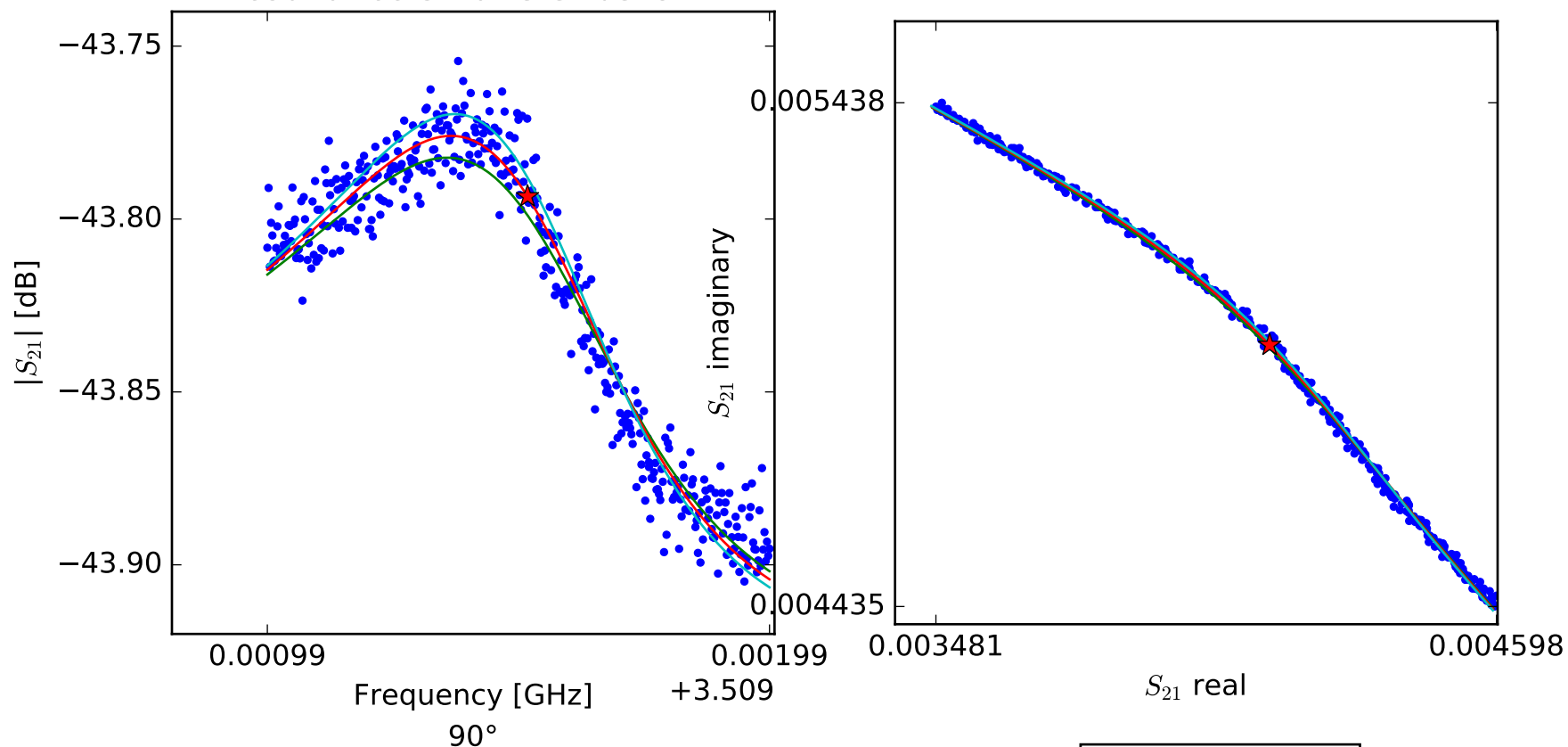
$$Q_c = 395703.300612$$

$$a = (0.000581420371701 - 0.00650126344097j)$$

$$\phi_0 = 0.209972057999$$

$$\tau = 36.3547717315$$

resonance 52 at 3.5105 GHz



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.51050819516$$

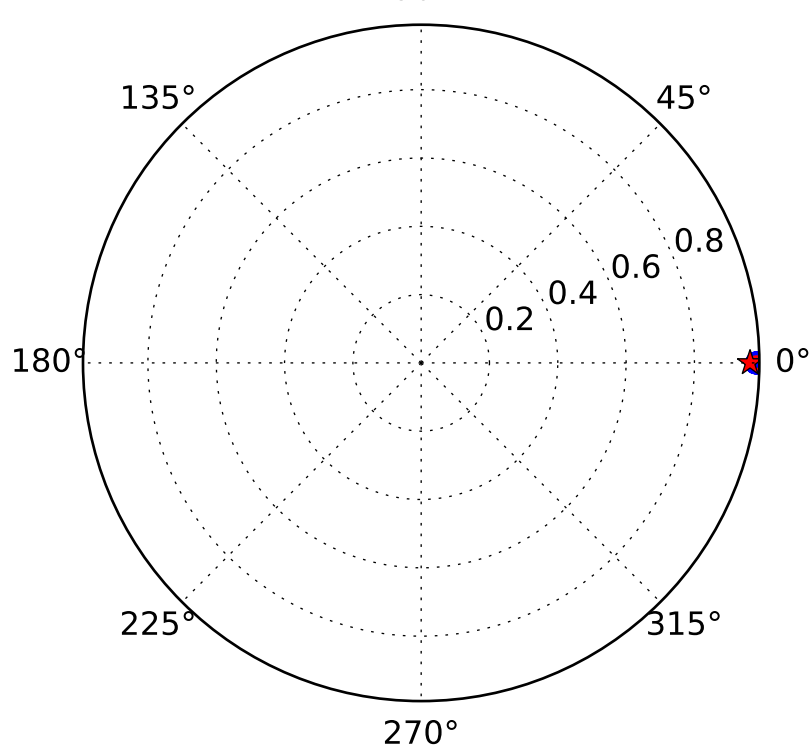
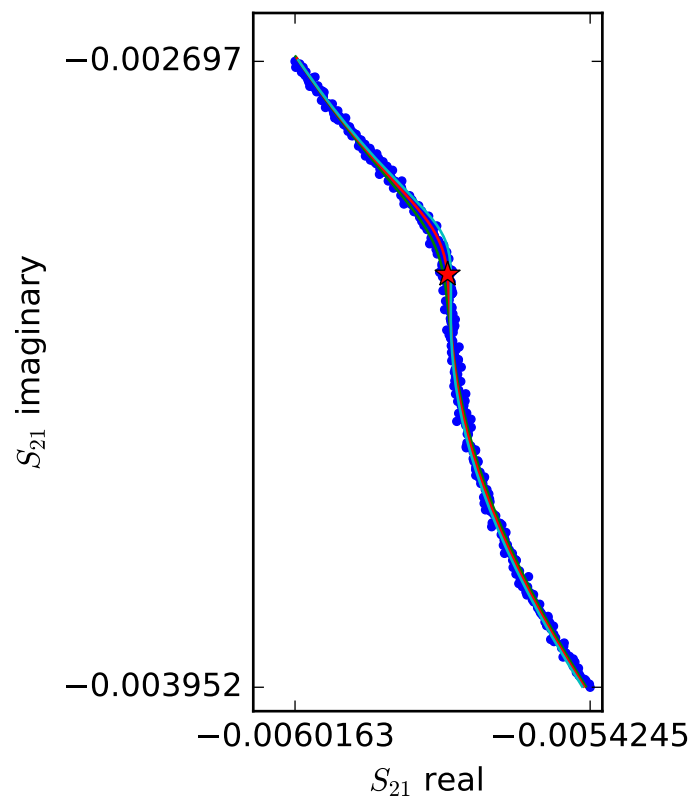
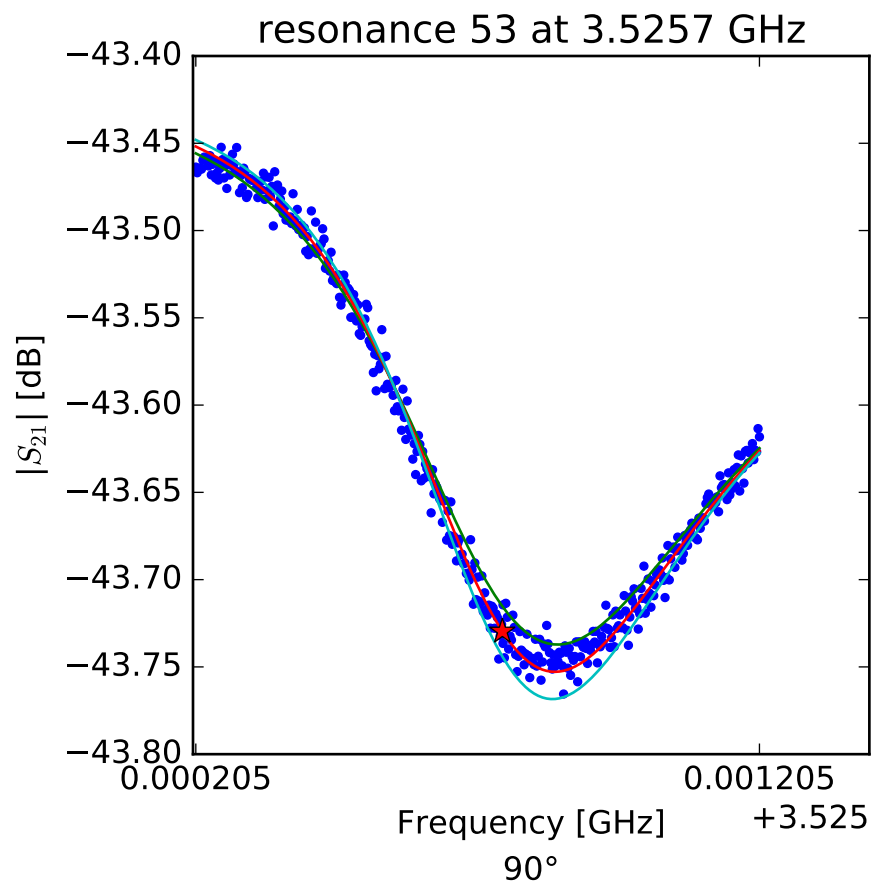
$$Q_r = 4307.43026927$$

$$Q_c = 256332.2139$$

$$a = (0.00429632071838 - 0.00471720946716j)$$

$$\phi_0 = 2.42073044476$$

$$\tau = 35.2446715472$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.52574885768$$

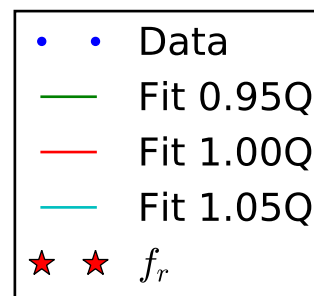
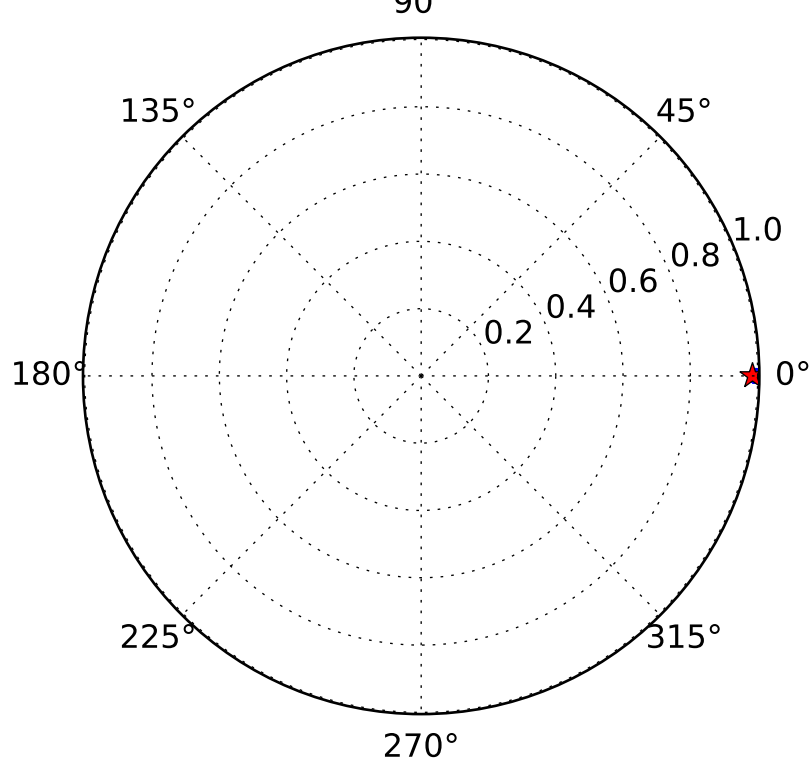
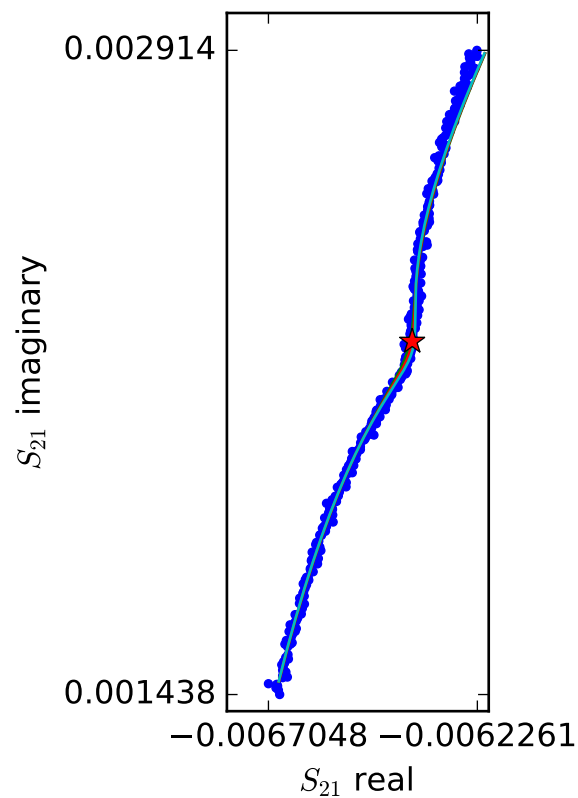
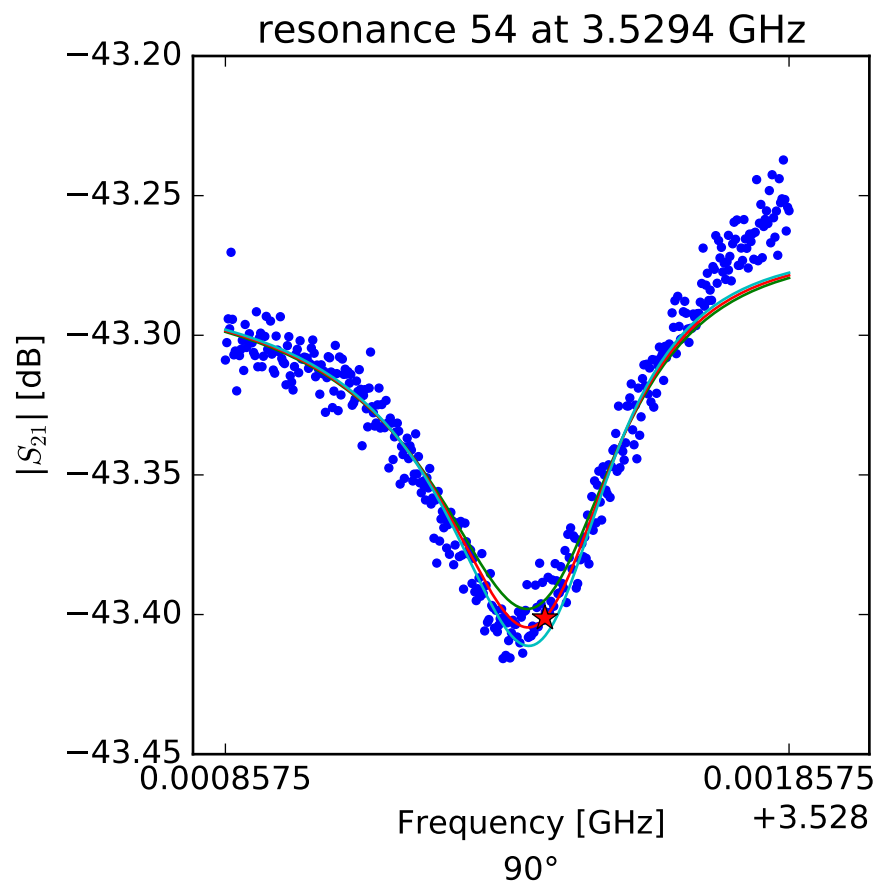
$$Q_r = 5114.99118386$$

$$Q_c = 137324.84734$$

$$a = (-0.00115413260506 + 0.00662570694058j)$$

$$\phi_0 = 0.518365541156$$

$$\tau = 37.6359023011$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.52942435736$$

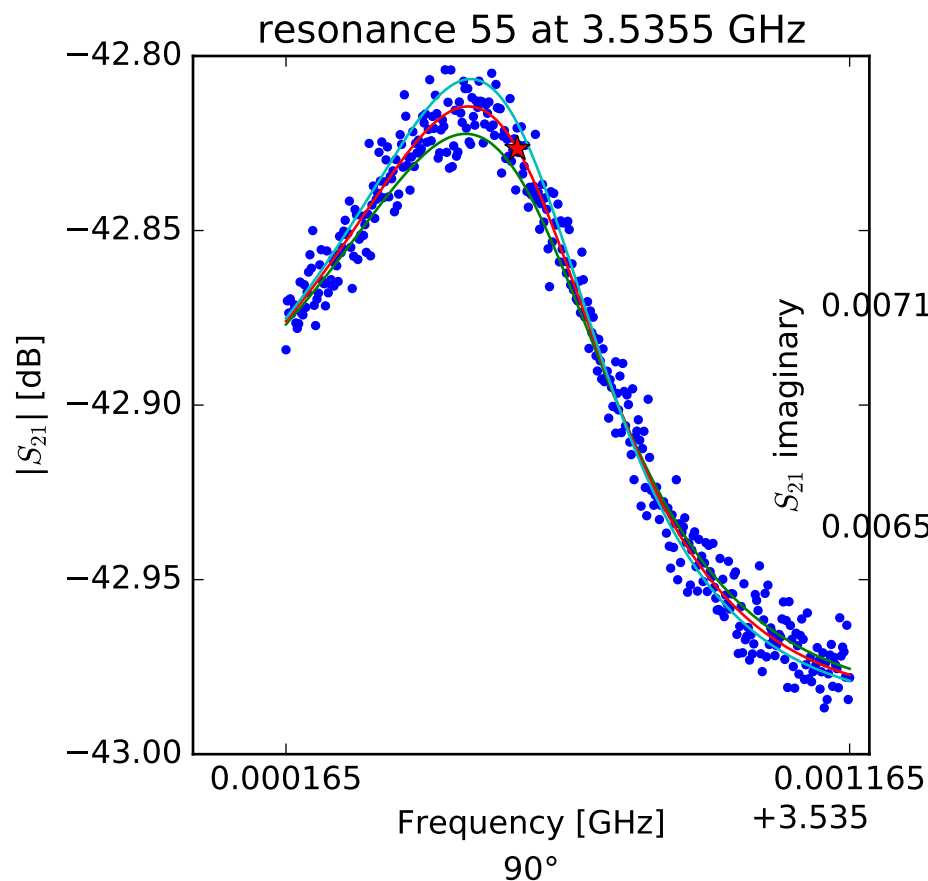
$$Q_r = 9313.23594828$$

$$Q_c = 605597.0116$$

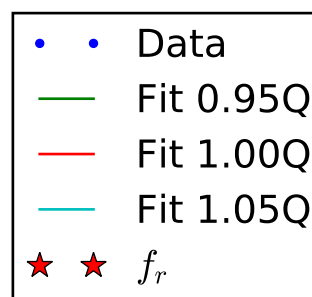
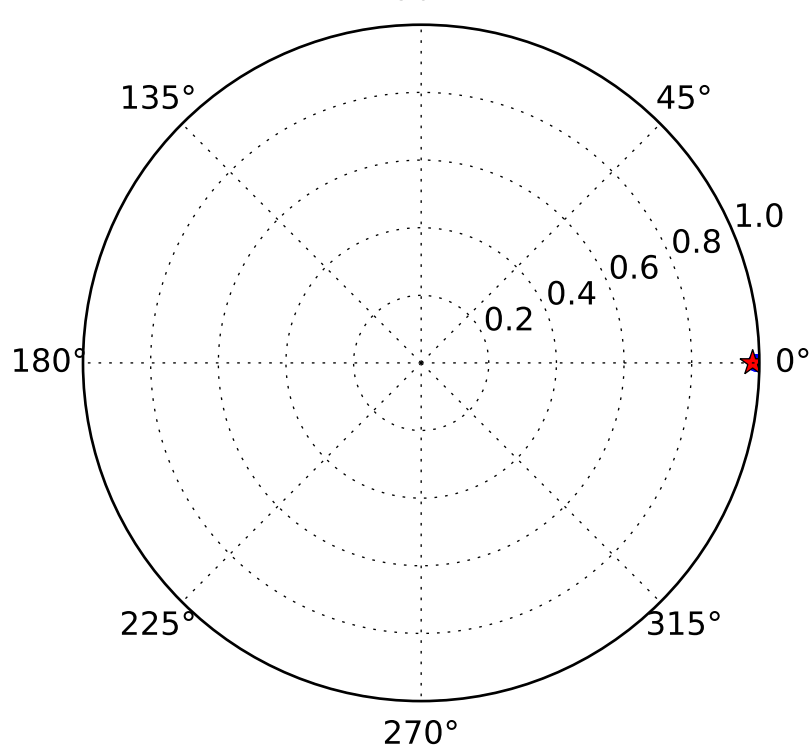
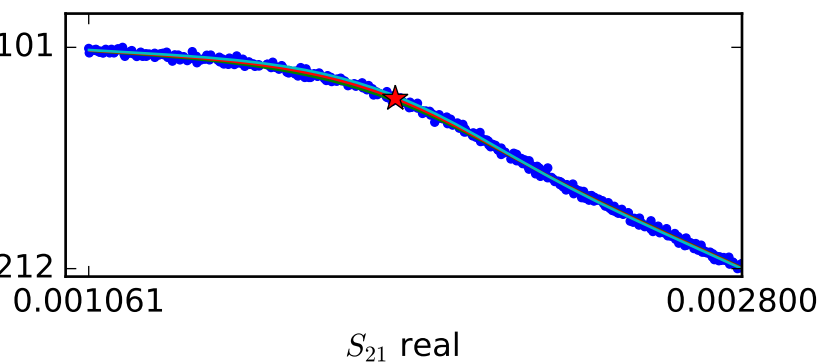
$$a = (-0.00540120525101 - 0.0042295279149j)$$

$$\phi_0 = -0.311898351827$$

$$\tau = 36.8786576695$$

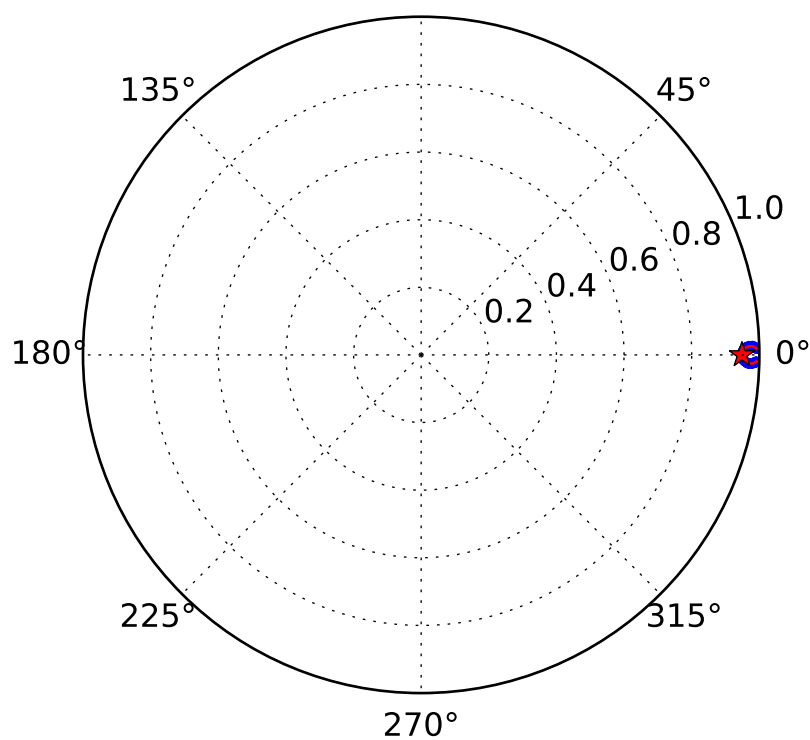
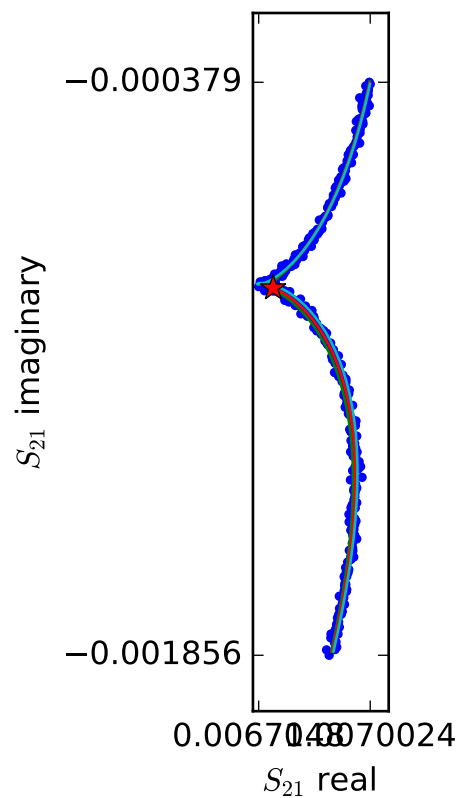
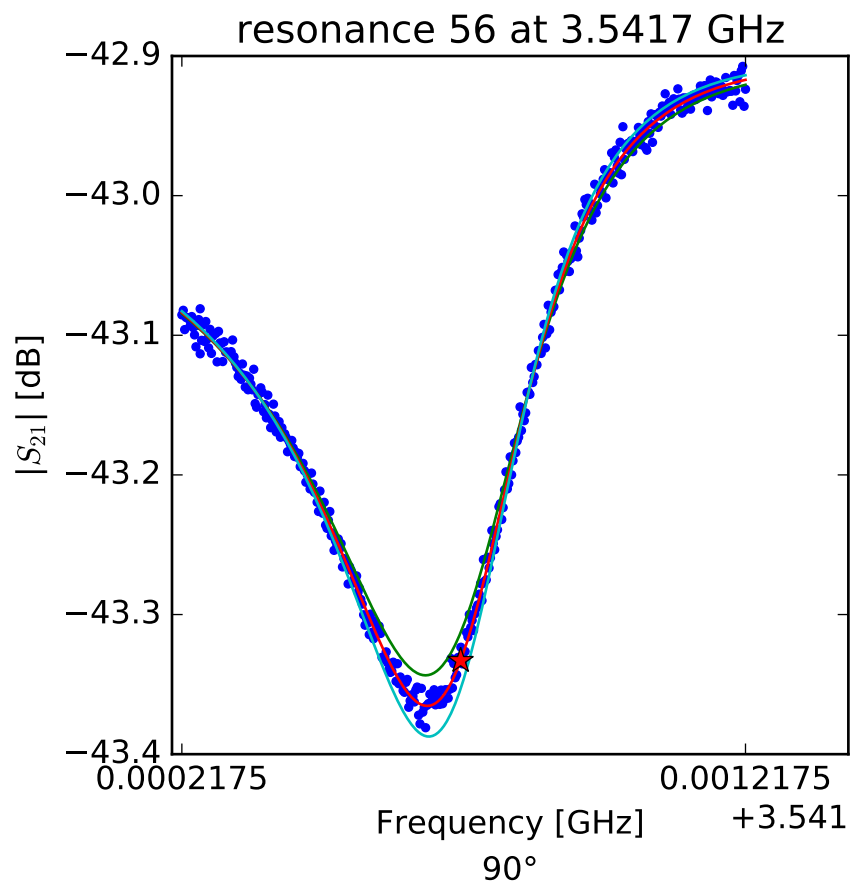


S_{21} imaginary



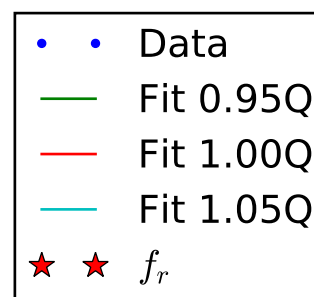
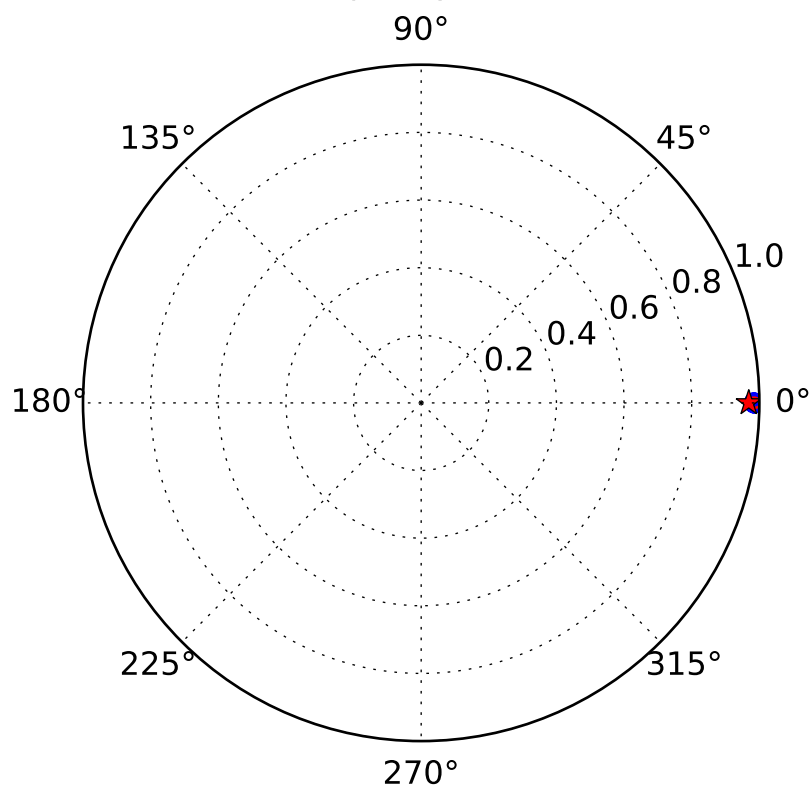
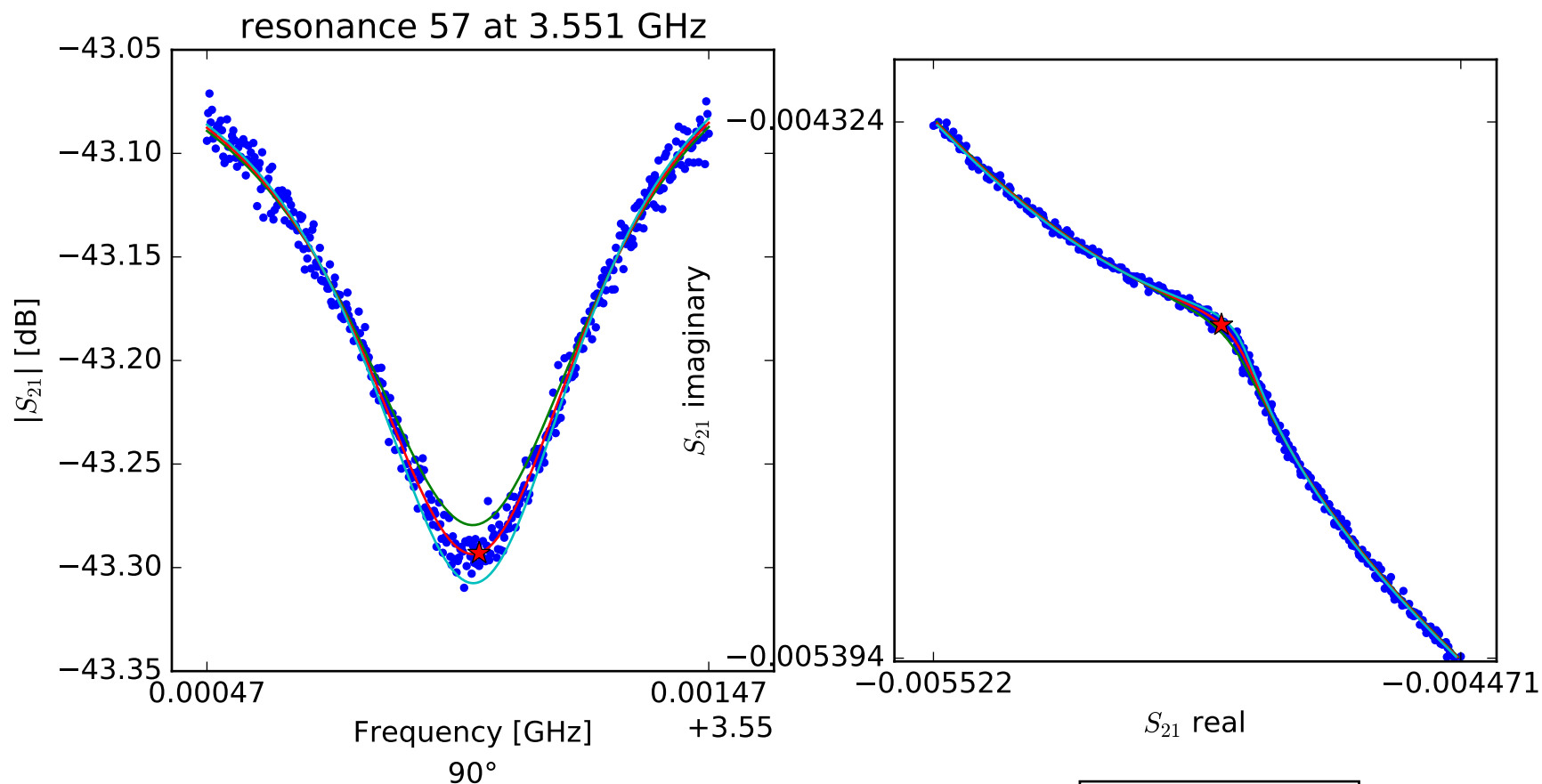
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.53557557787 \\ Q_r &= 5653.56938998 \\ Q_c &= 285030.267955 \\ a &= (0.0034274879376 - 0.00621987385947j) \\ \phi_0 &= 2.59239865651 \\ \tau &= 38.6416260196 \end{aligned}$$



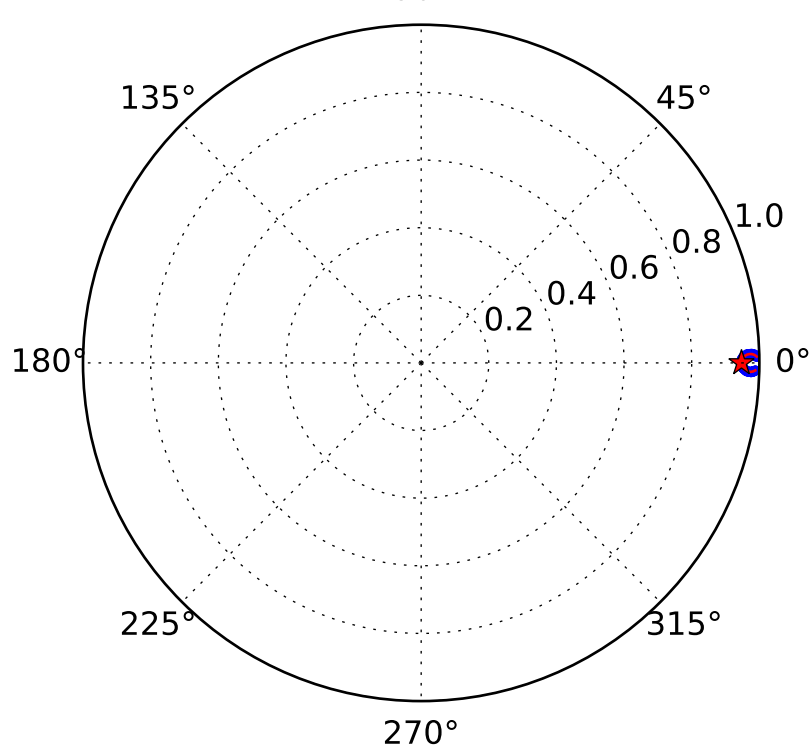
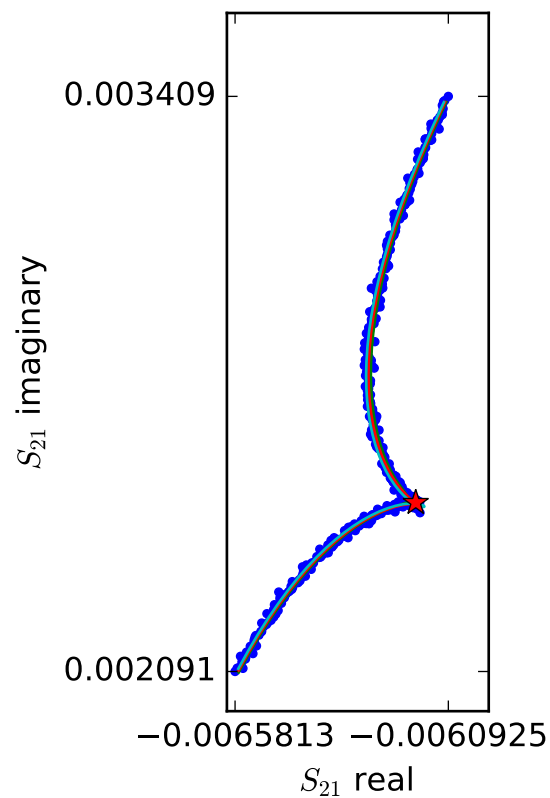
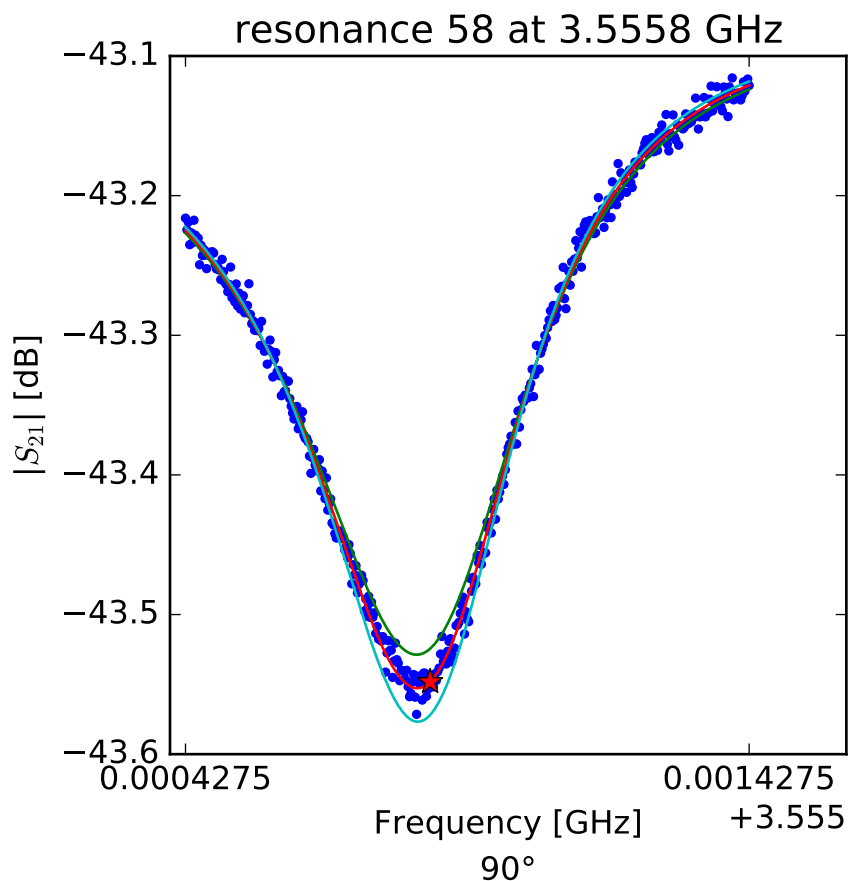
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.54171209955 \\ Q_r &= 8034.57183494 \\ Q_c &= 155933.458236 \\ a &= (-0.00437385364219 + 0.0056321581067j) \\ \phi_0 &= -0.512369323613 \\ \tau &= 38.2246196835 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.55101248902 \\ Q_r &= 6071.0405065 \\ Q_c &= 193794.872544 \\ a &= (0.00381934564188 + 0.00594384983542j) \\ \phi_0 &= -0.0830650329449 \\ \tau &= 38.1688699247 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.55586151329$$

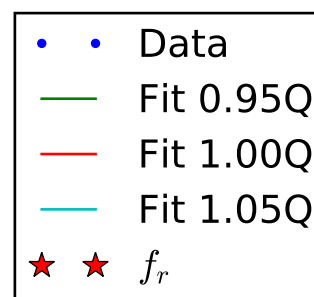
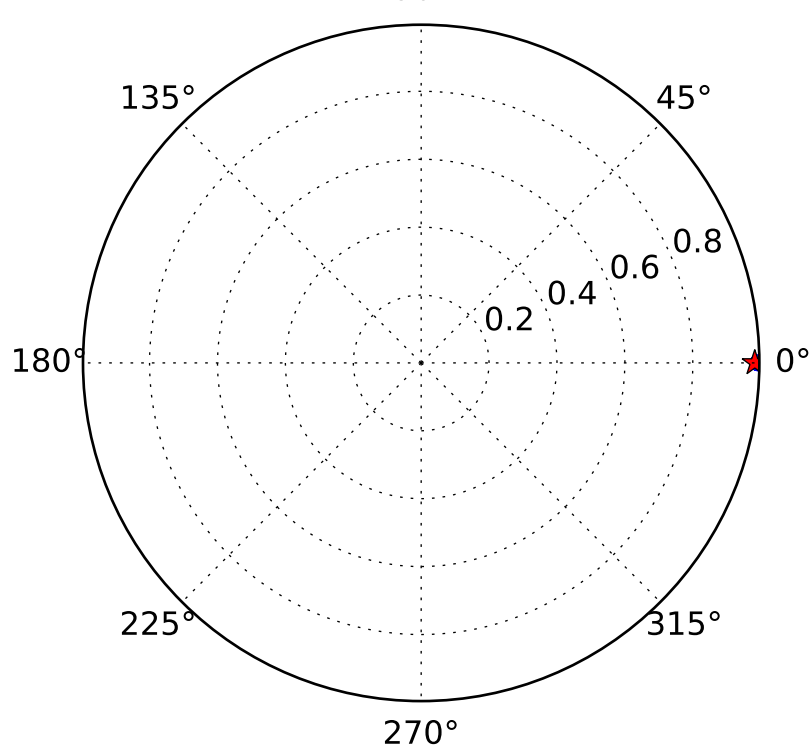
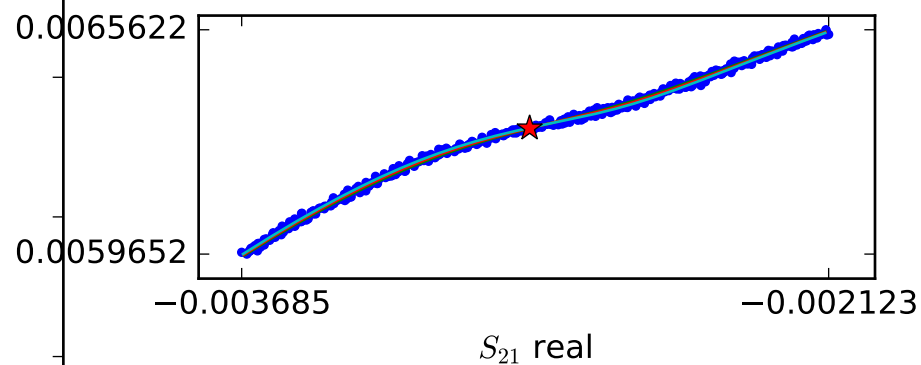
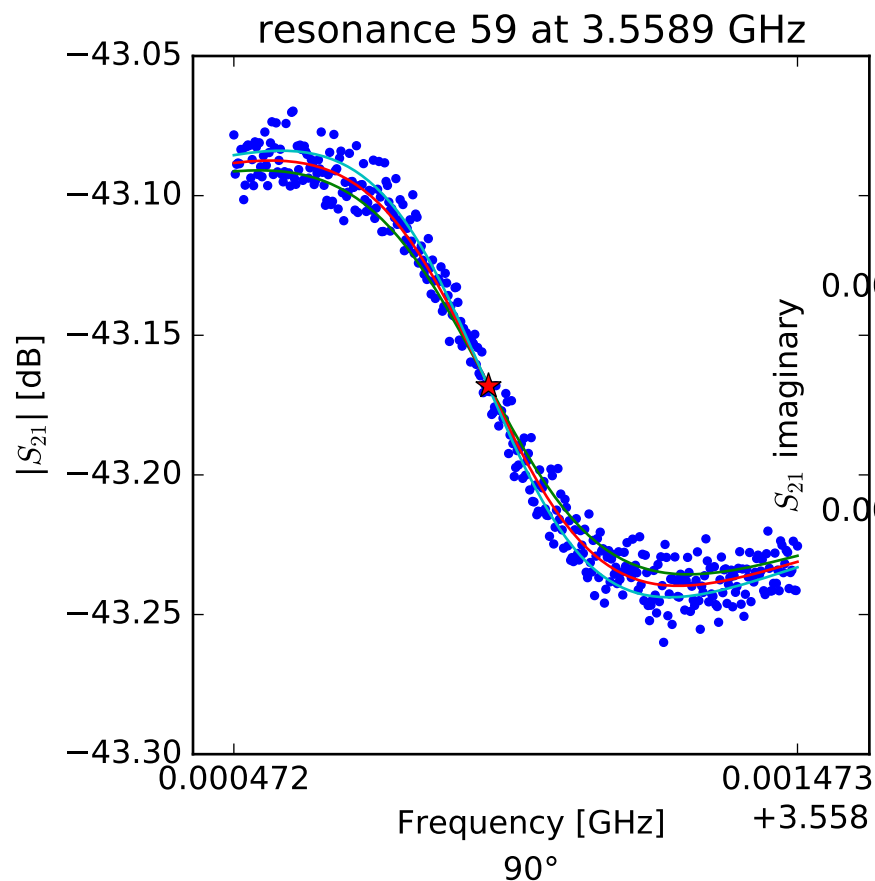
$$Q_r = 7485.65721031$$

$$Q_c = 141667.494753$$

$$a = (0.00621193338637 + 0.00324857094229j)$$

$$\phi_0 = -0.186733767355$$

$$\tau = 38.1452251308$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.55892429716$$

$$Q_r = 4932.49104345$$

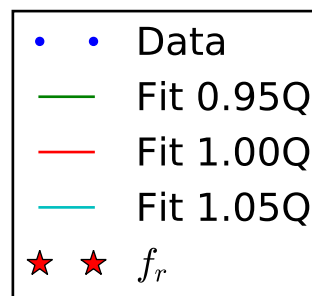
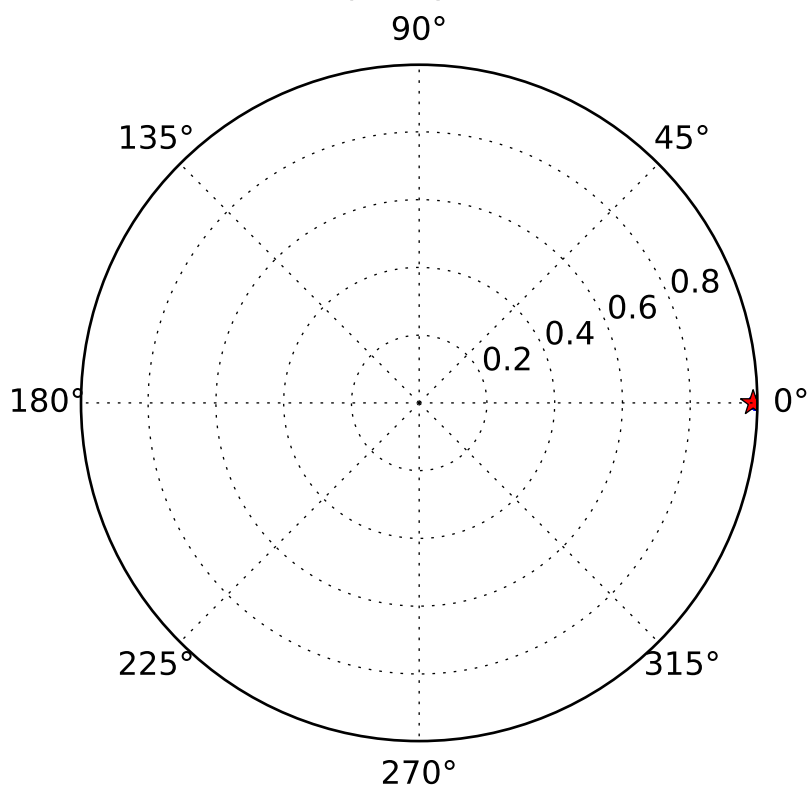
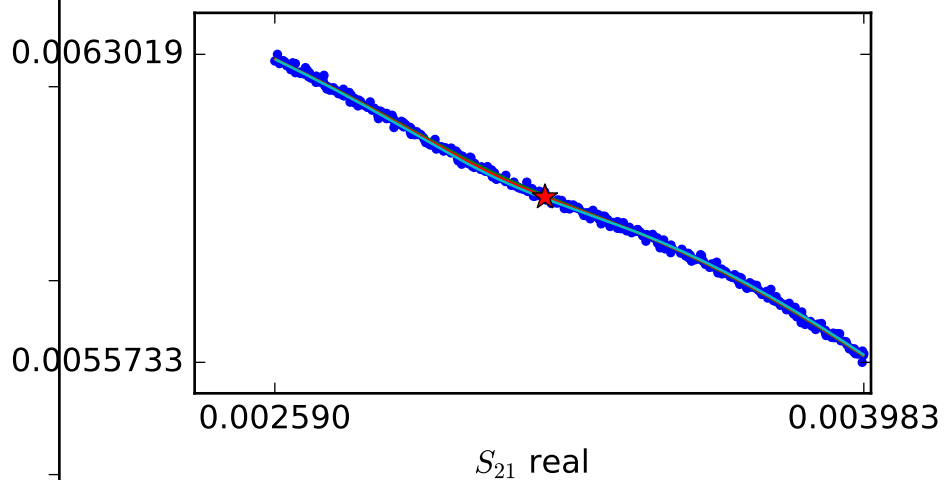
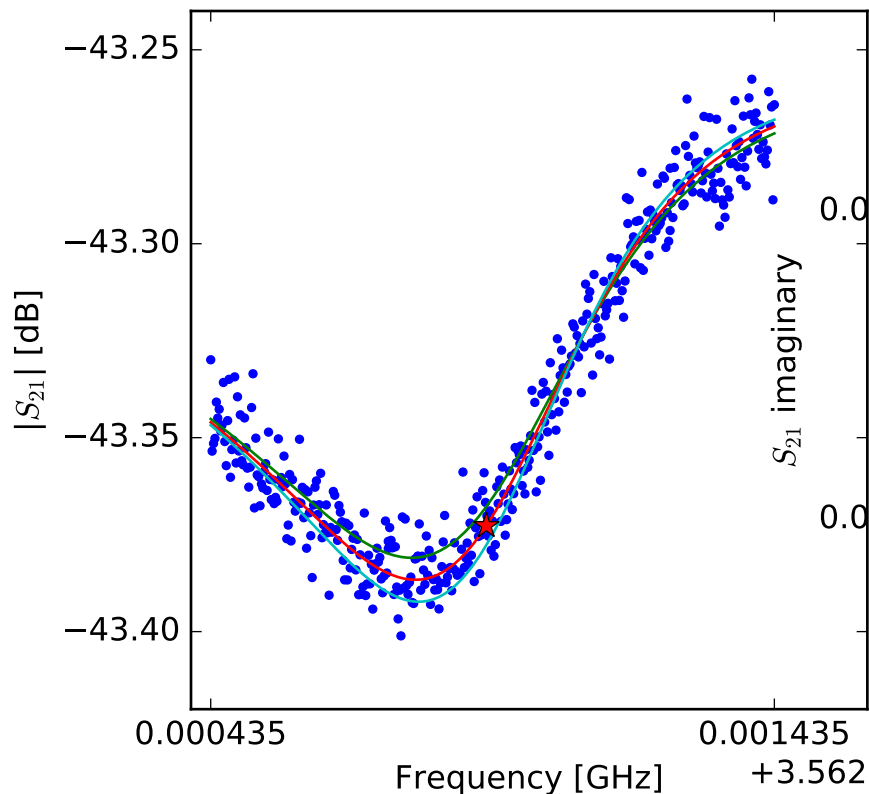
$$Q_c = 281499.213177$$

$$a = (0.00585227093785 - 0.00375273543264j)$$

$$\phi_0 = 1.49287897907$$

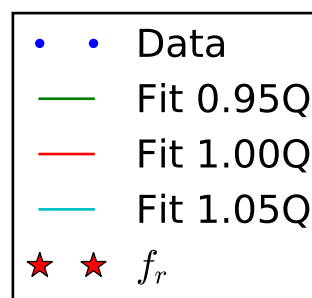
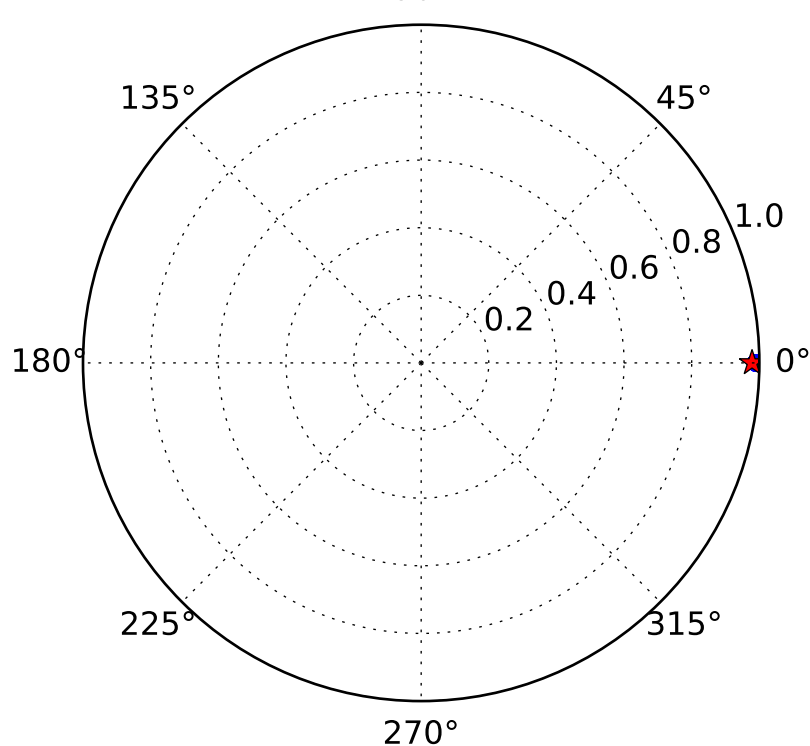
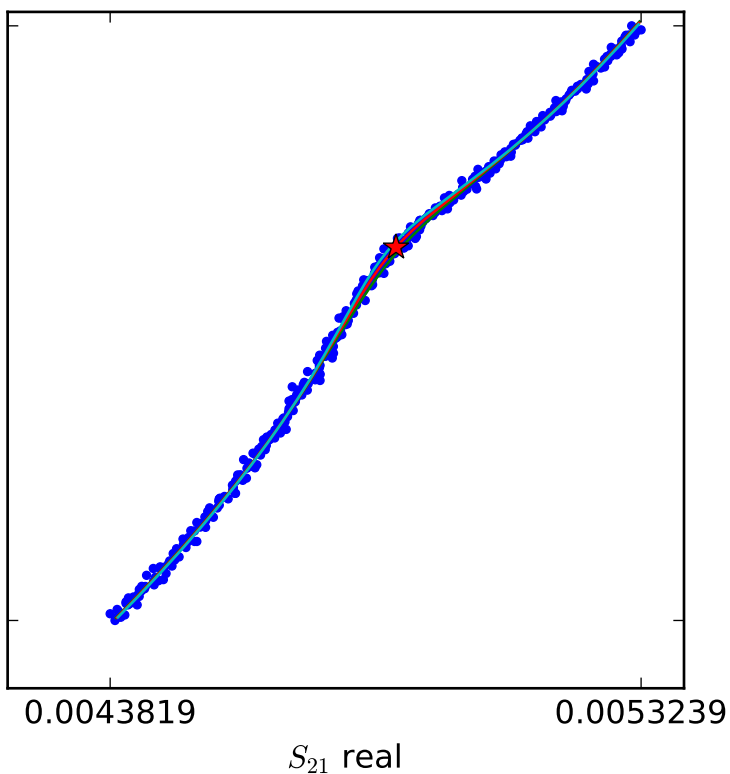
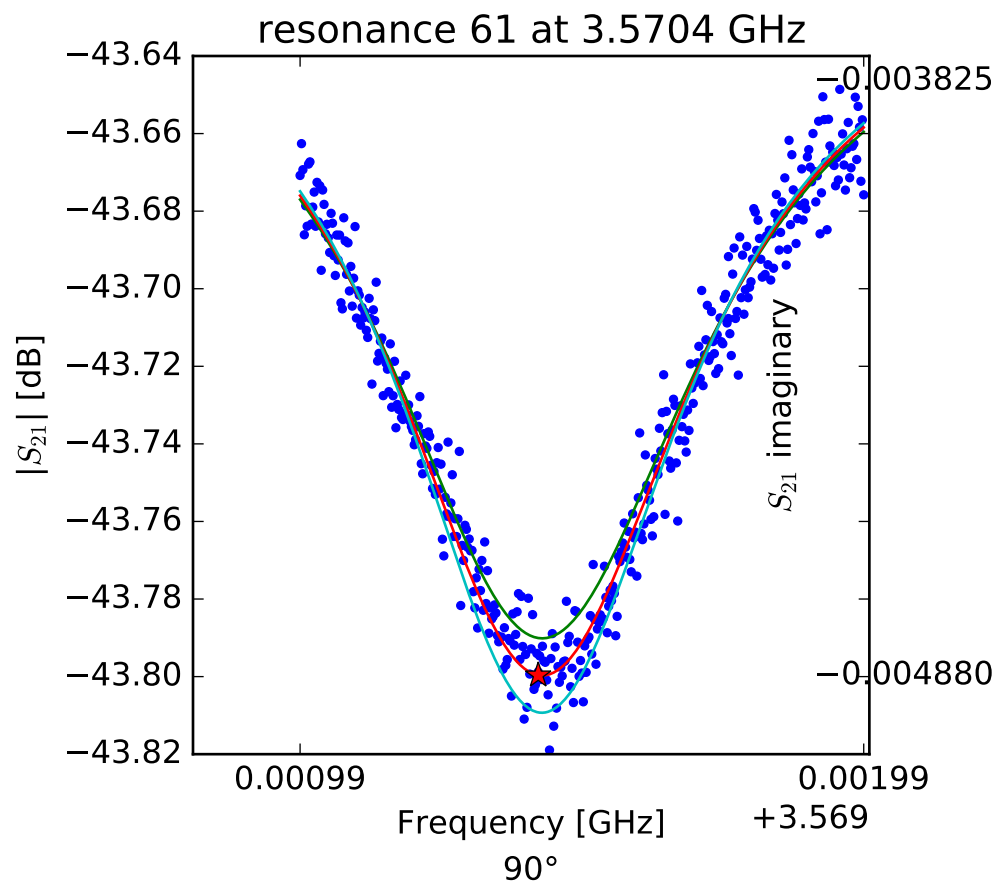
$$\tau = 38.378847051$$

resonance 60 at 3.5629 GHz



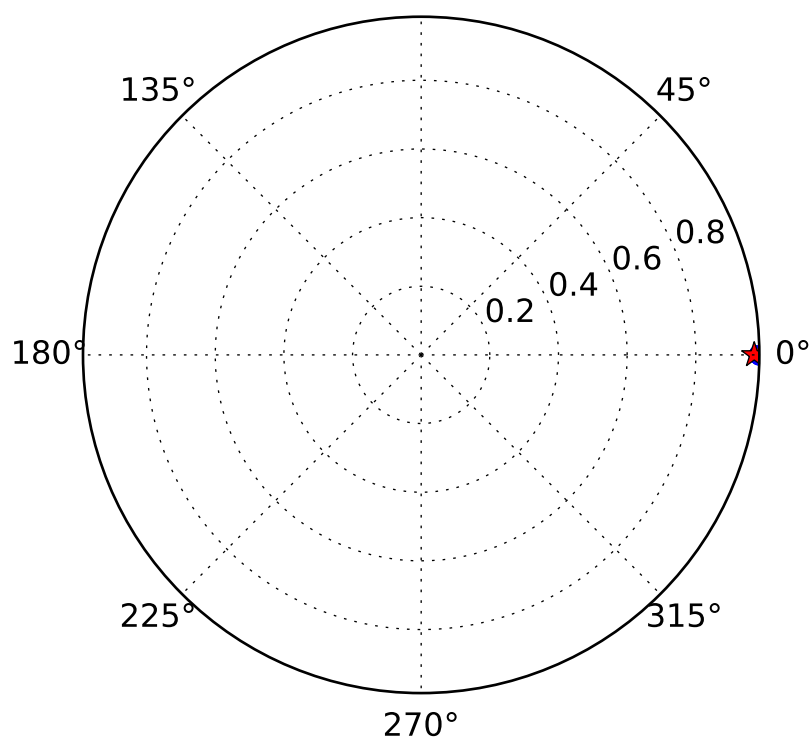
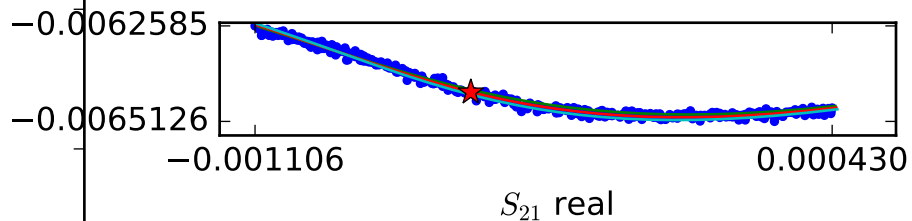
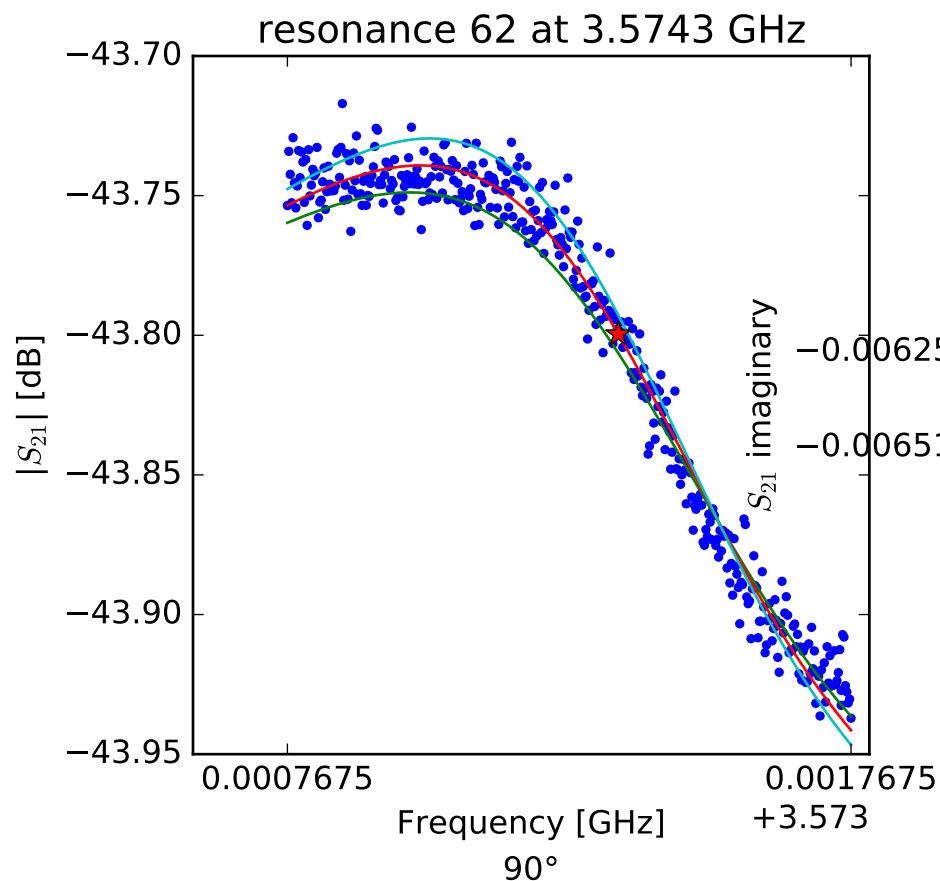
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.56292410494 \\ Q_r &= 4943.60823341 \\ Q_c &= 342025.832307 \\ a &= (-0.00666546413768 - 0.00162061464979j) \\ \phi_0 &= -0.66828179885 \\ \tau &= 37.9936168376 \end{aligned}$$



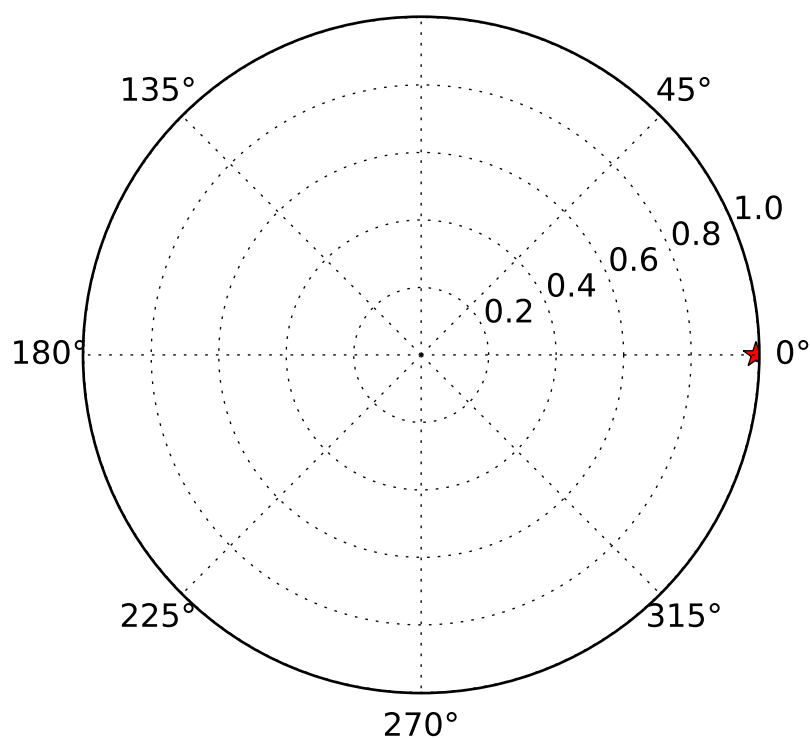
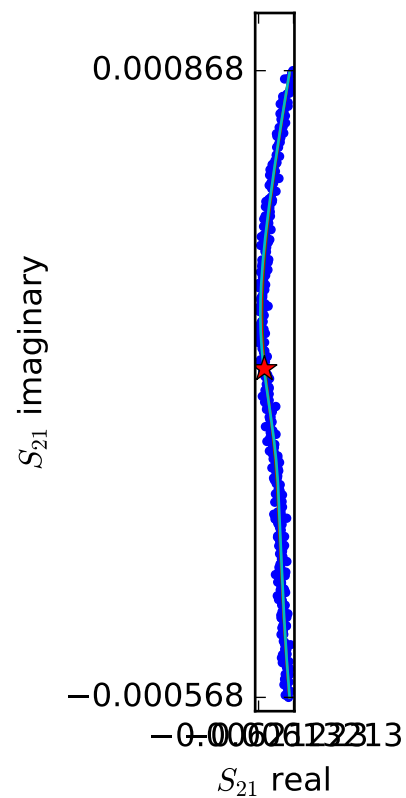
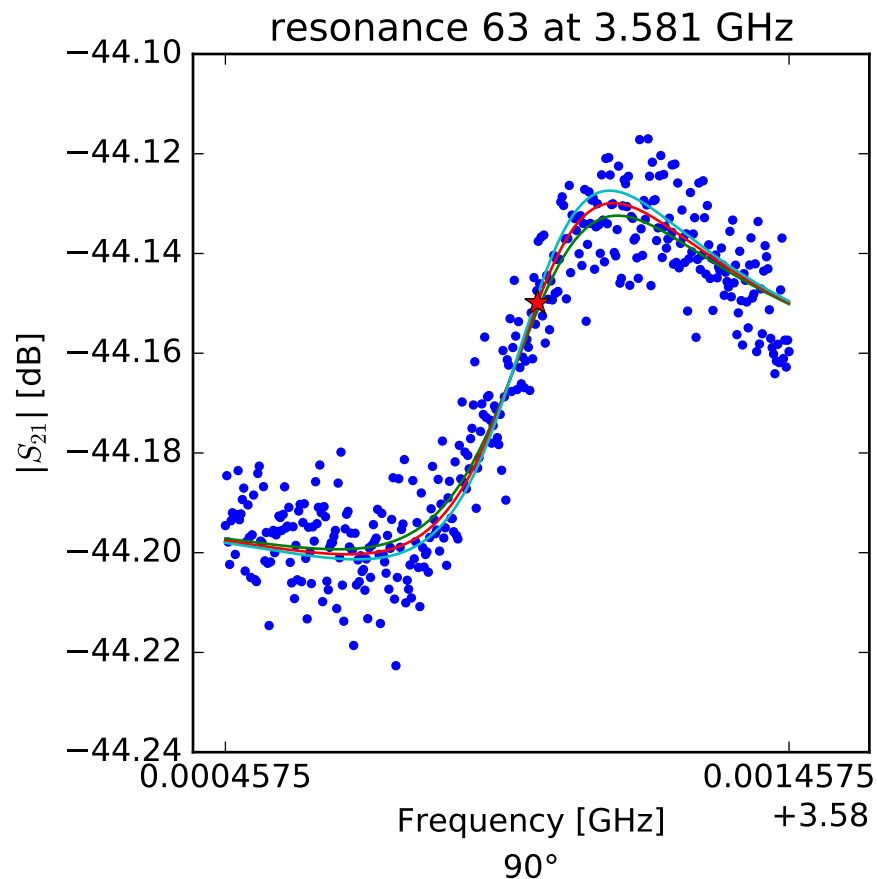
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.57041250546 \\ Q_r &= 5476.1164534 \\ Q_c &= 253344.27621 \\ a &= (0.00464258811821 + 0.00469015542989j) \\ \phi_0 &= 0.0413595395902 \\ \tau &= 37.317523461 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.57435456376 \\ Q_r &= 2849.13835462 \\ Q_c &= 95186.9459606 \\ a &= (0.000479690647763 - 0.00633958622483j) \\ \phi_0 &= 2.10607997924 \\ \tau &= 35.5367939367 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r(\frac{f-f_r}{f_r})} \right]$$

$$f_r = 3.58101118677$$

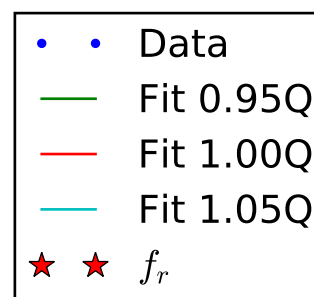
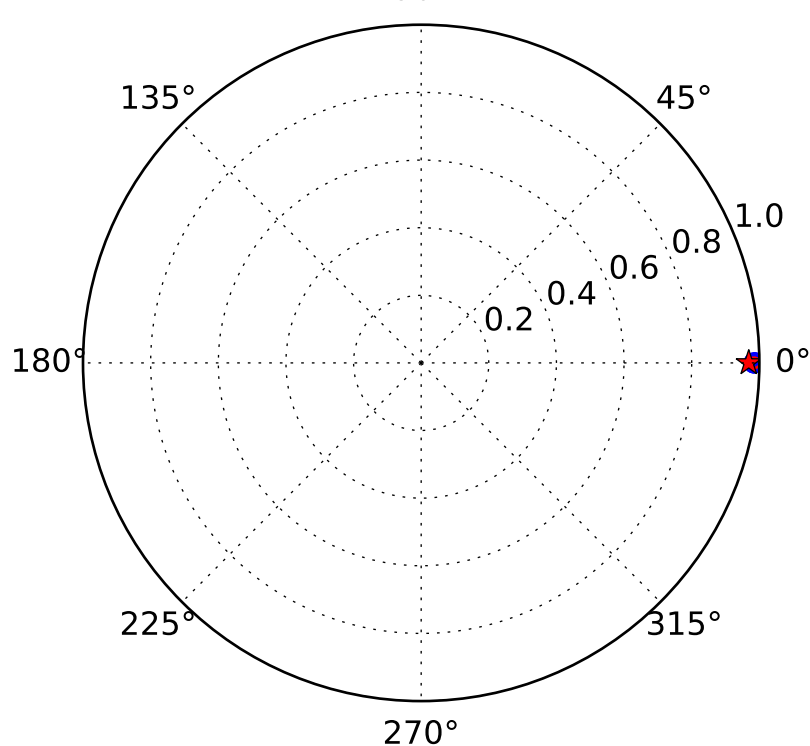
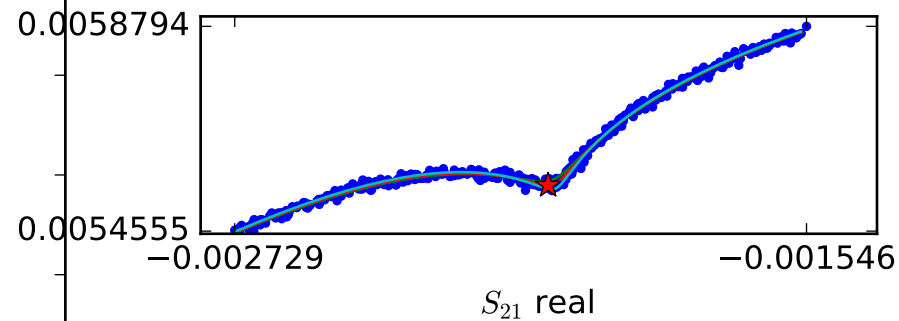
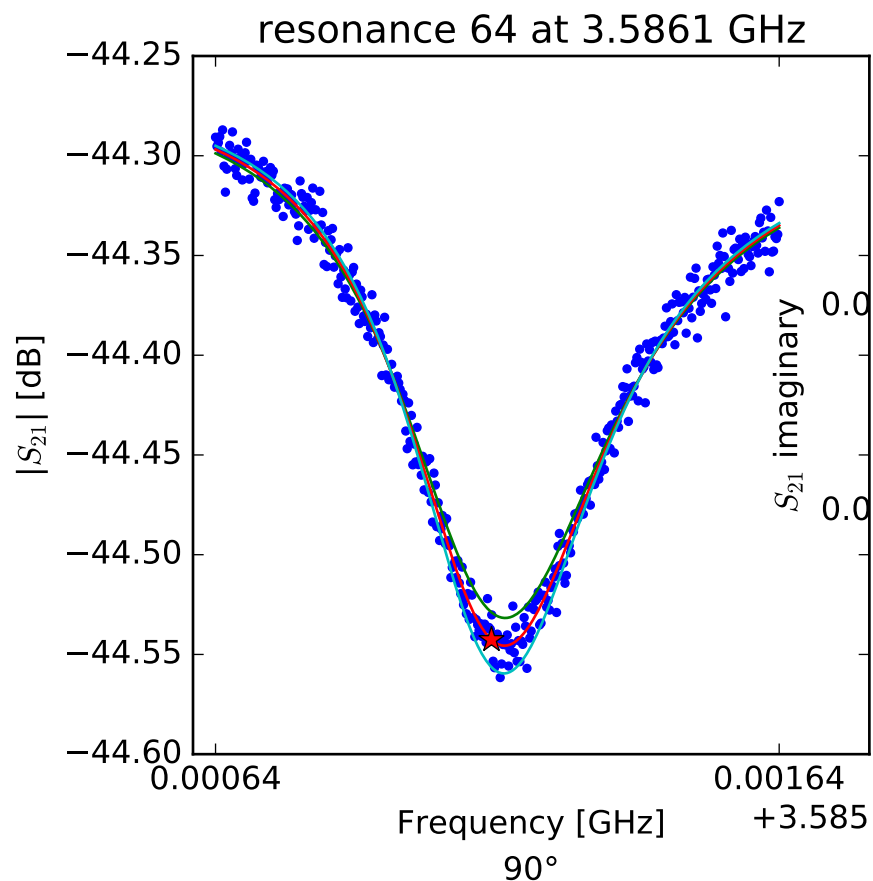
$$Q_r = 8423.82163734$$

$$Q_c = 1037092.15422$$

$$a = (-0.00583357693176 + 0.00204031812131j)$$

$$\phi_0 = -2.01040903903$$

$$\tau = 36.5685409288$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.58612957035$$

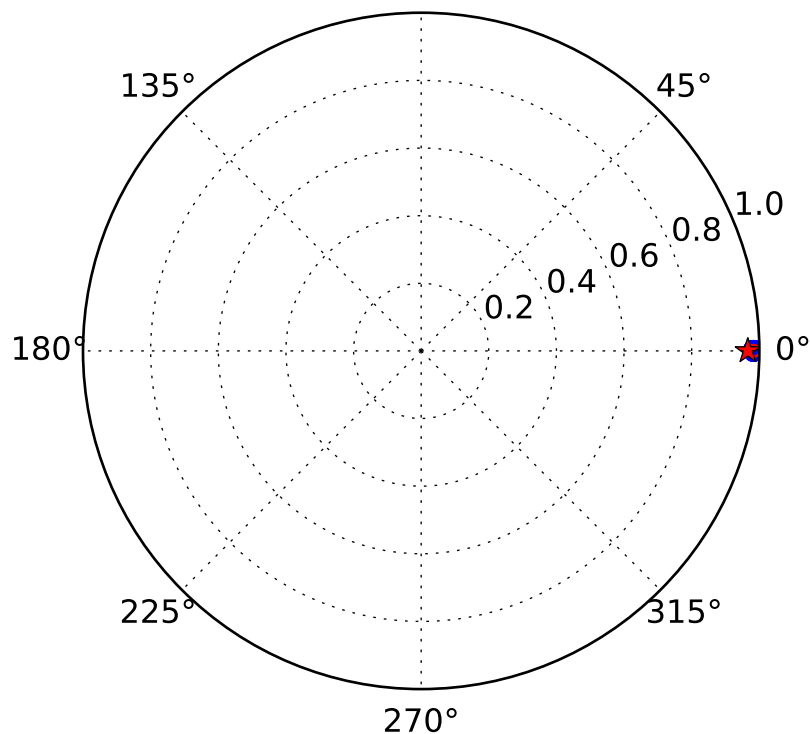
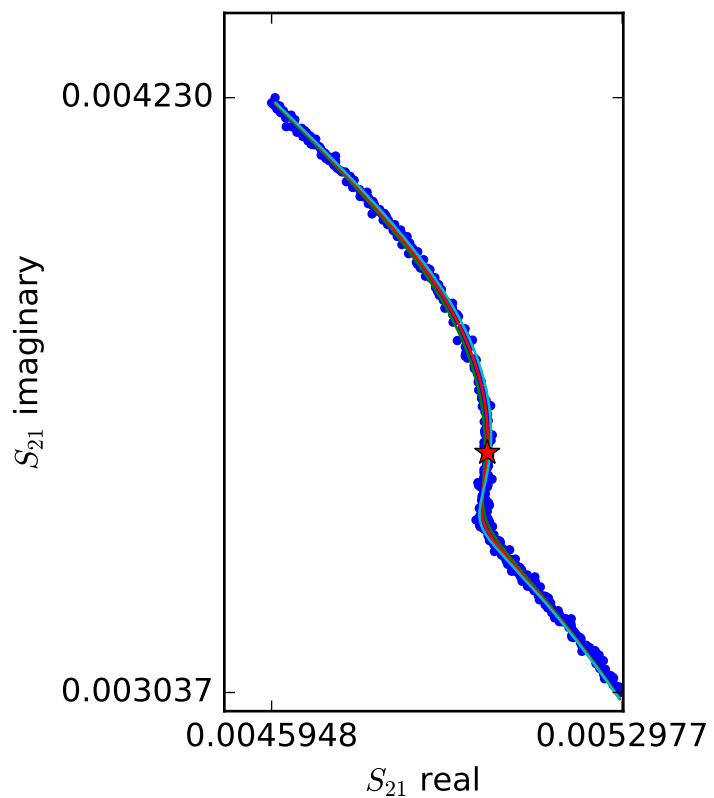
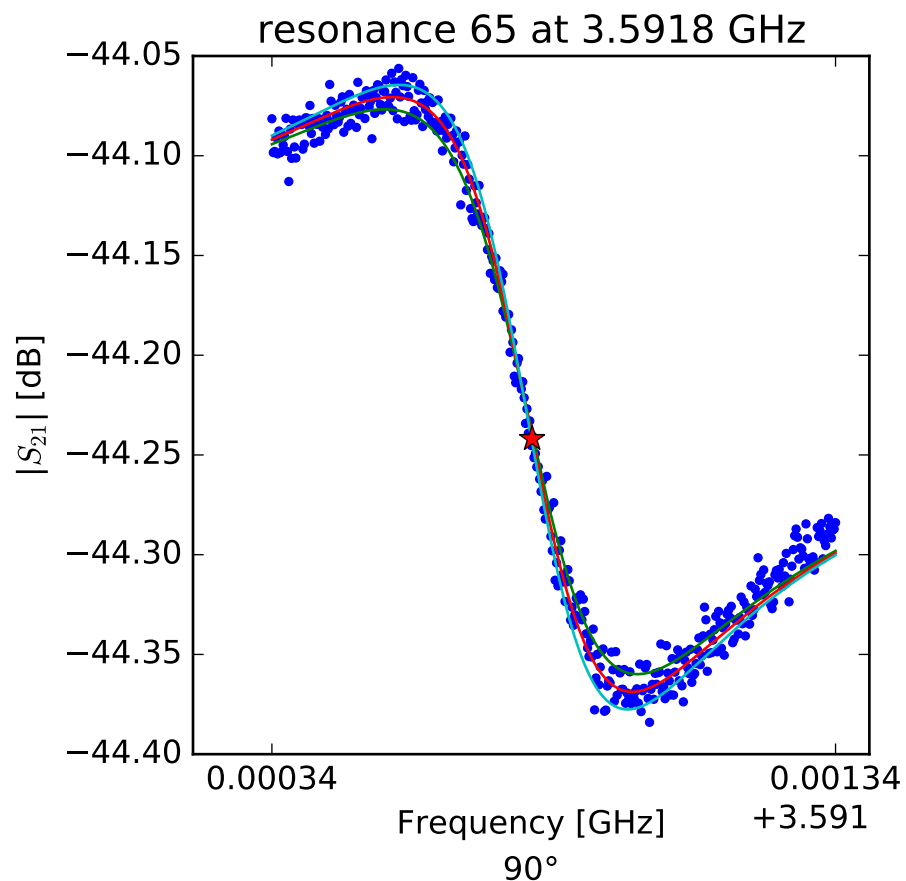
$$Q_r = 7989.75323292$$

$$Q_c = 254855.785718$$

$$a = (0.000599371332589 + 0.00608570964302j)$$

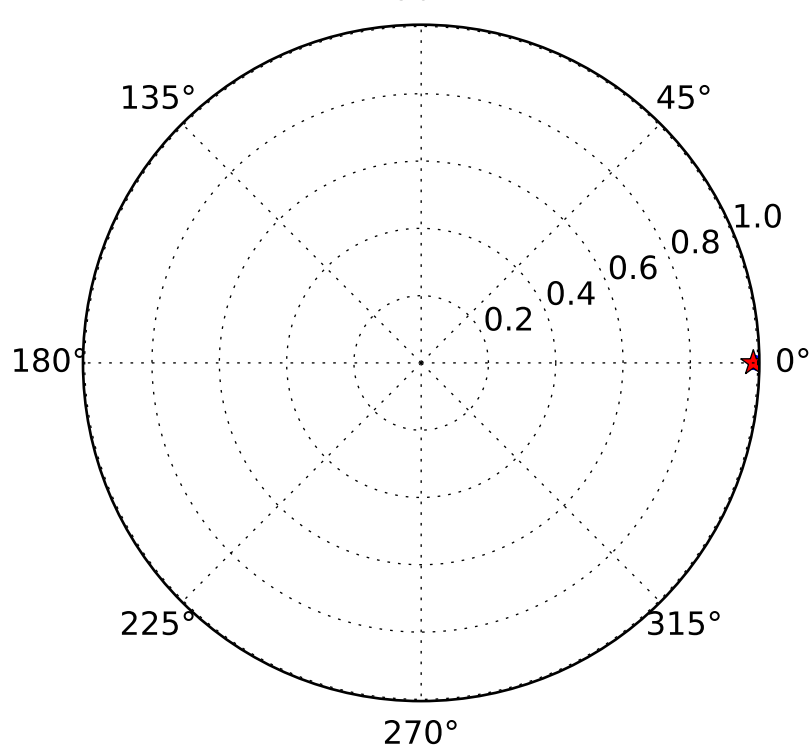
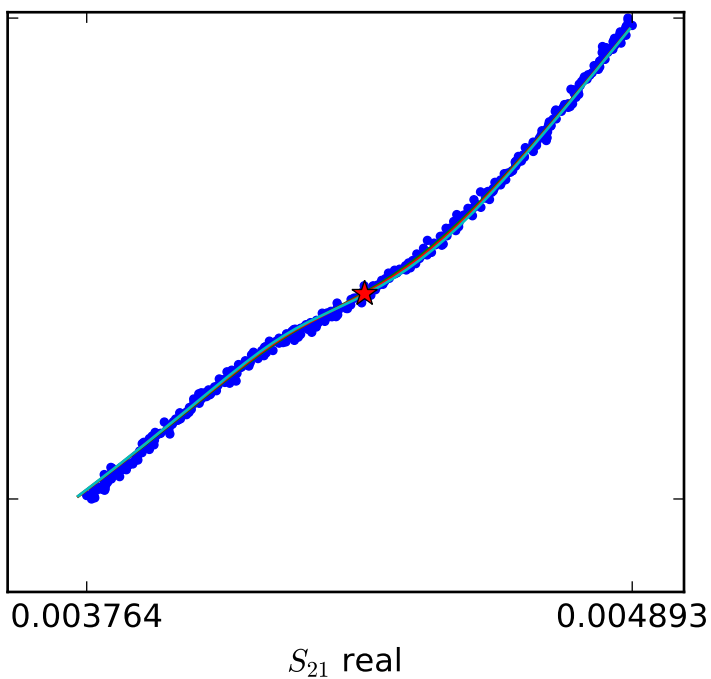
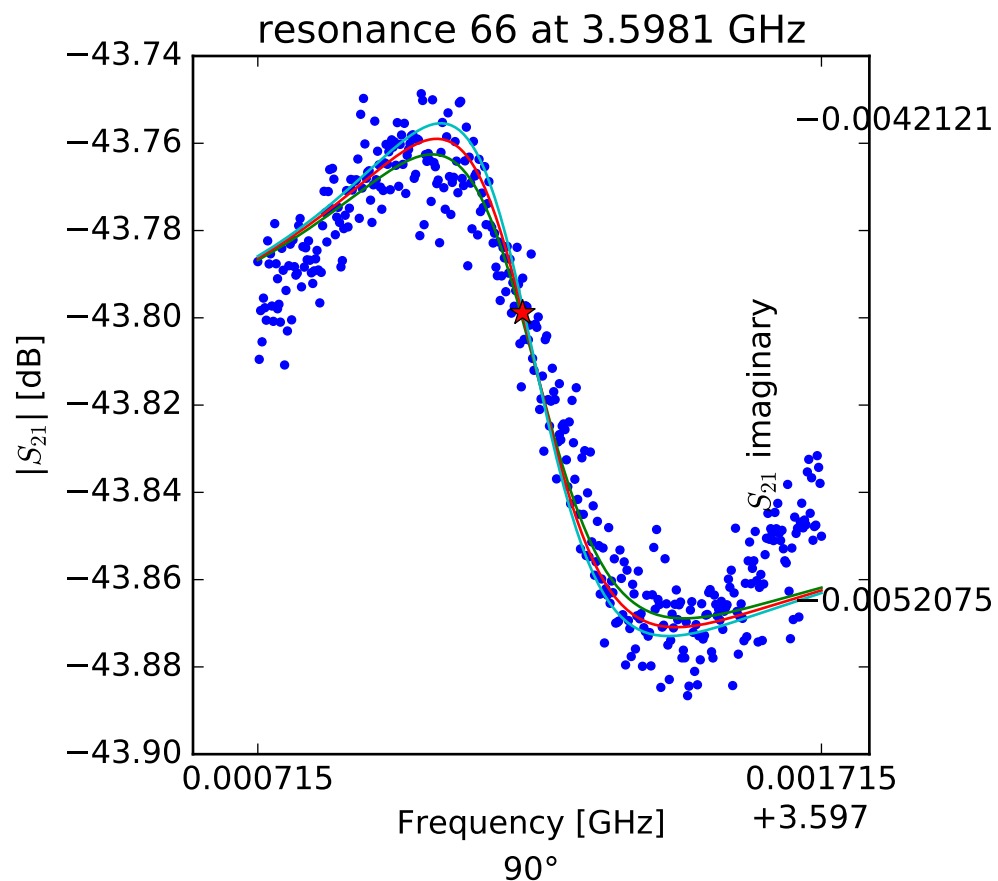
$$\phi_0 = 0.201519856313$$

$$\tau = 36.2302191514$$



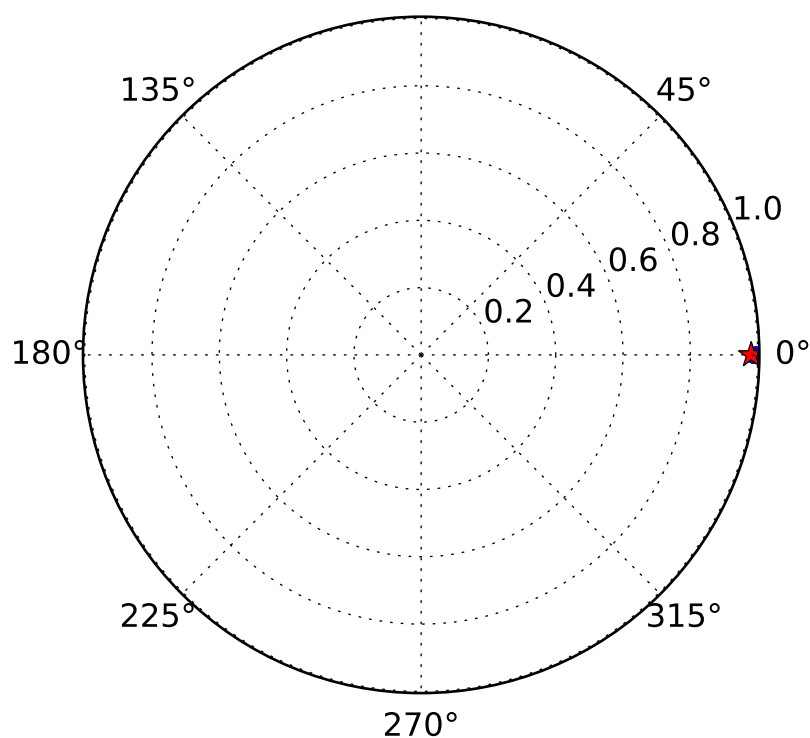
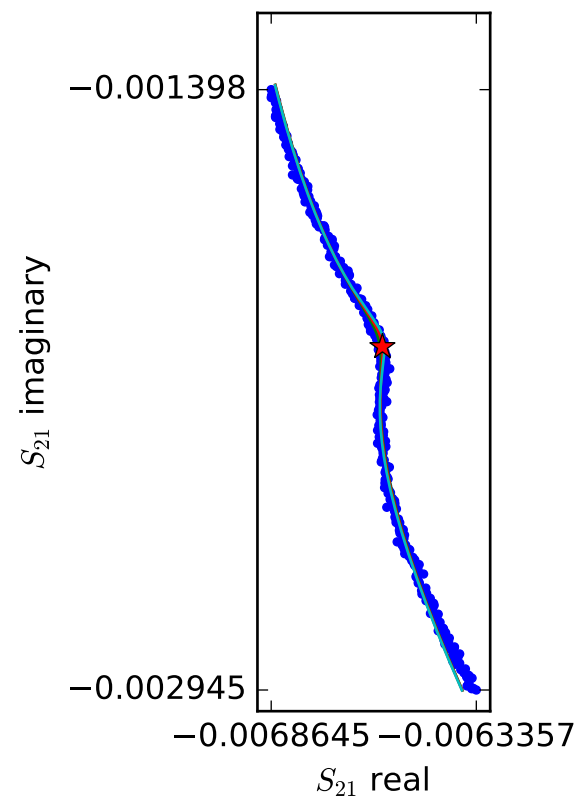
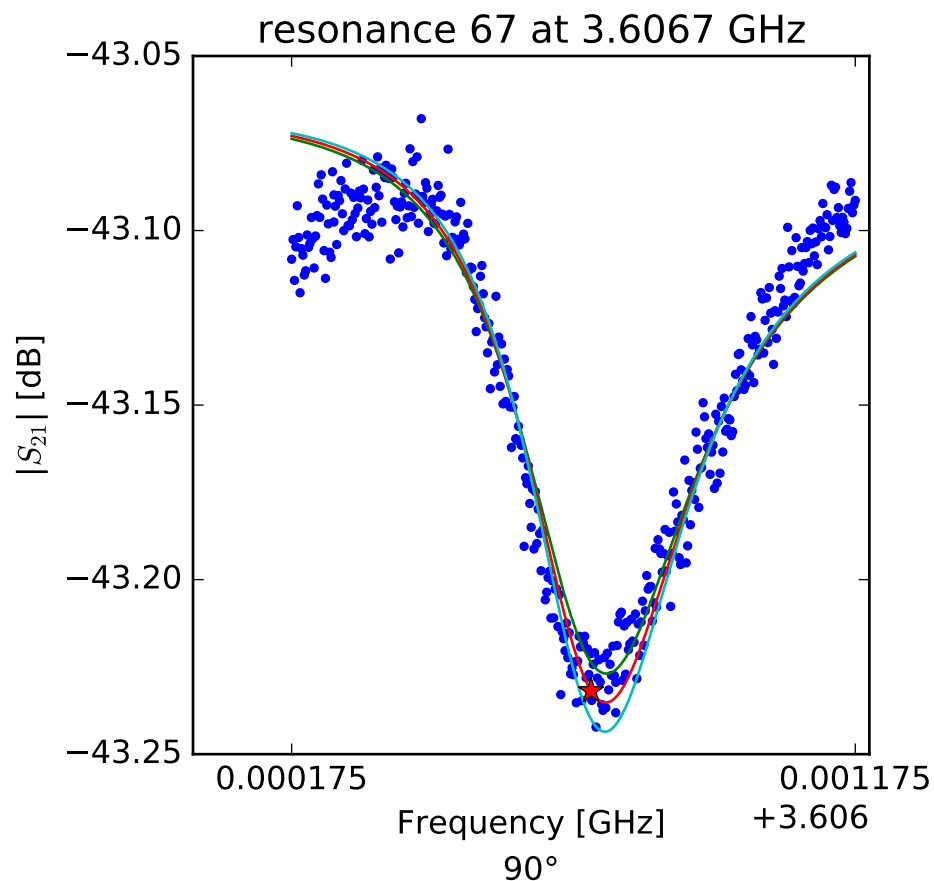
$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.59180172377 \\ Q_r &= 8552.75972651 \\ Q_c &= 249927.882188 \\ a &= (-0.00606444099285 - 0.00114339301762j) \\ \phi_0 &= 1.38747166263 \\ \tau &= 36.3124393396 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r(\frac{f-f_r}{f_r})} \right]$$

$f_r = 3.59818471279$
 $Q_r = 8844.58147469$
 $Q_c = 685097.50818$
 $a = (0.00498019900104 - 0.00407356295868j)$
 $\phi_0 = 1.85028447624$
 $\tau = 36.6911818303$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.60670625832$$

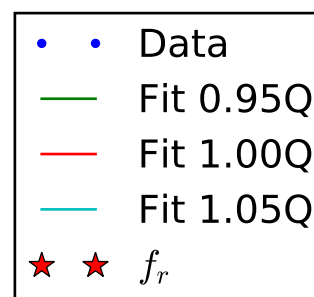
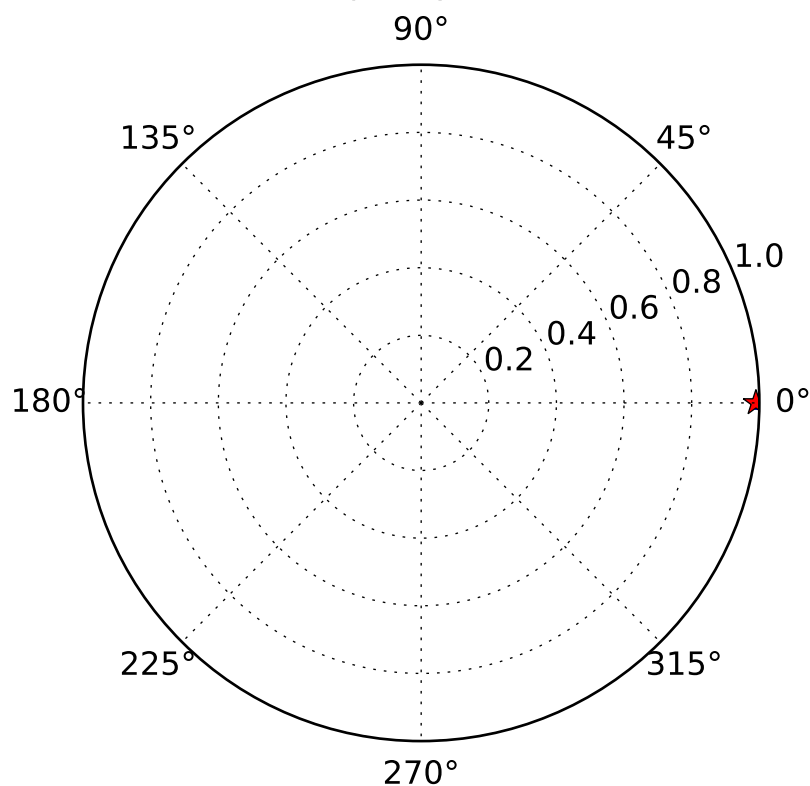
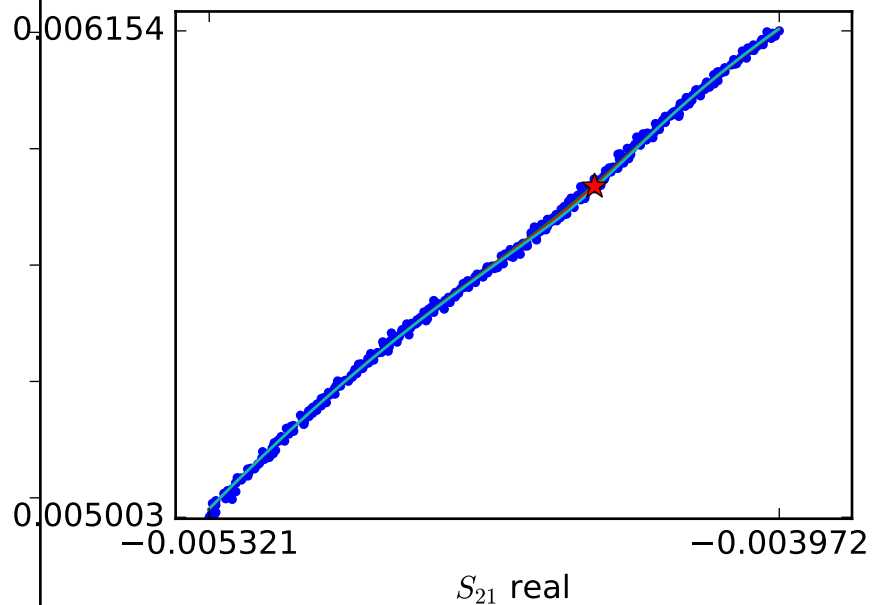
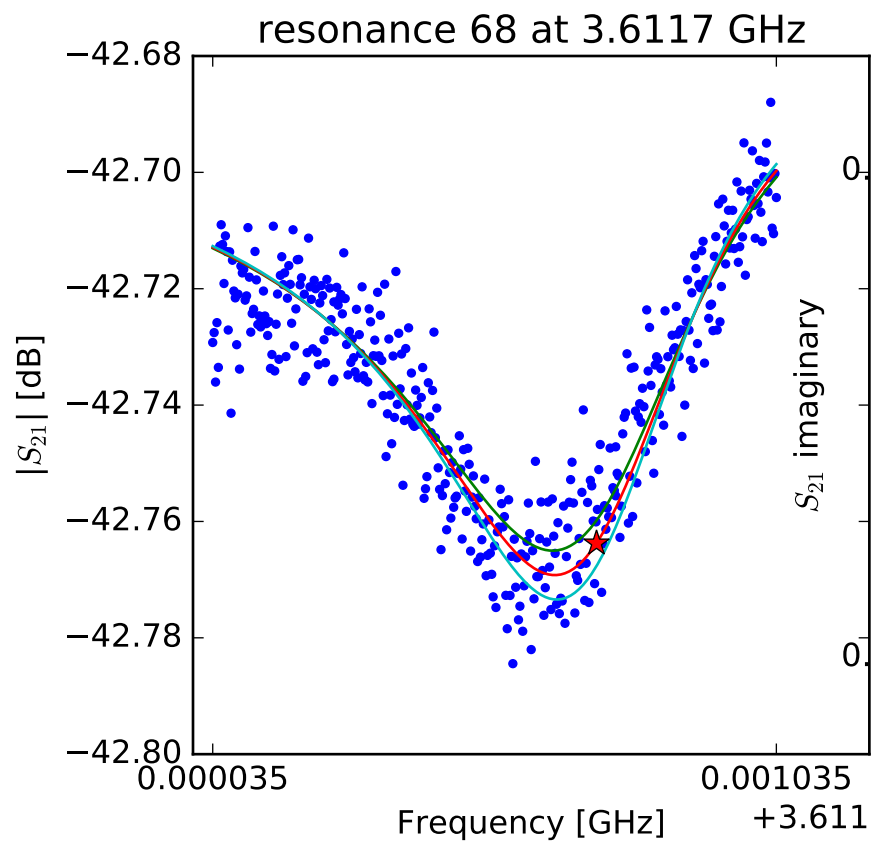
$$Q_r = 9896.28541201$$

$$Q_c = 515768.402037$$

$$a = (-0.00550599176687 + 0.00435866886923j)$$

$$\phi_0 = 0.279581619941$$

$$\tau = 39.0506582804$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.61171592839$$

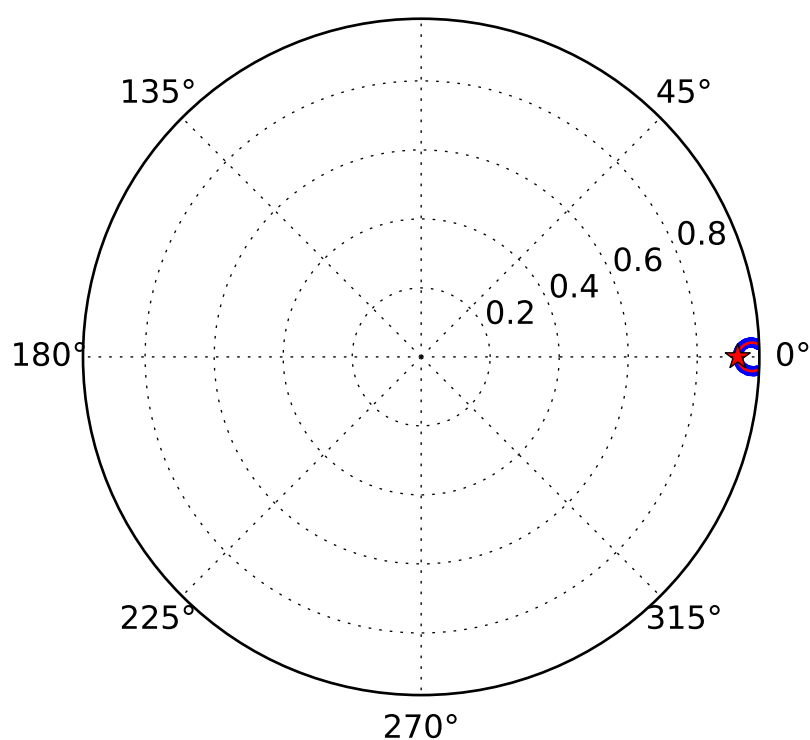
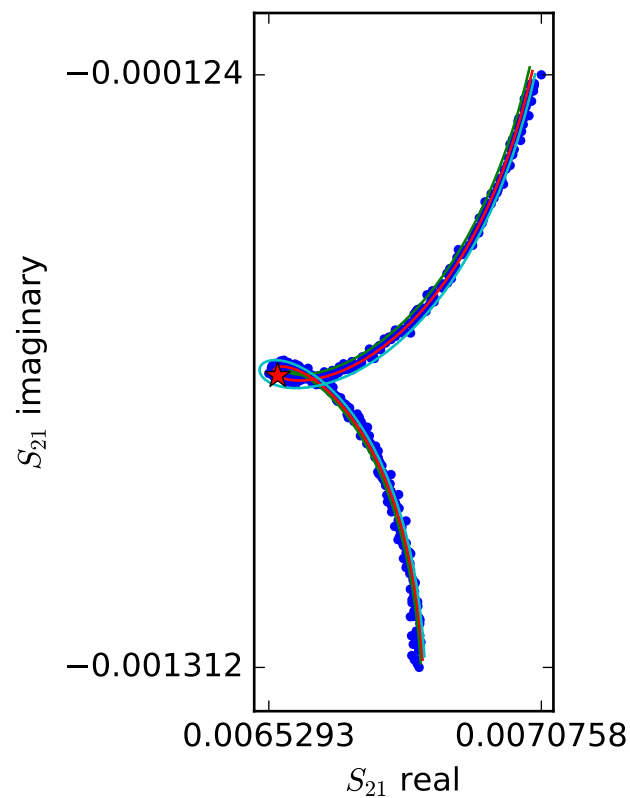
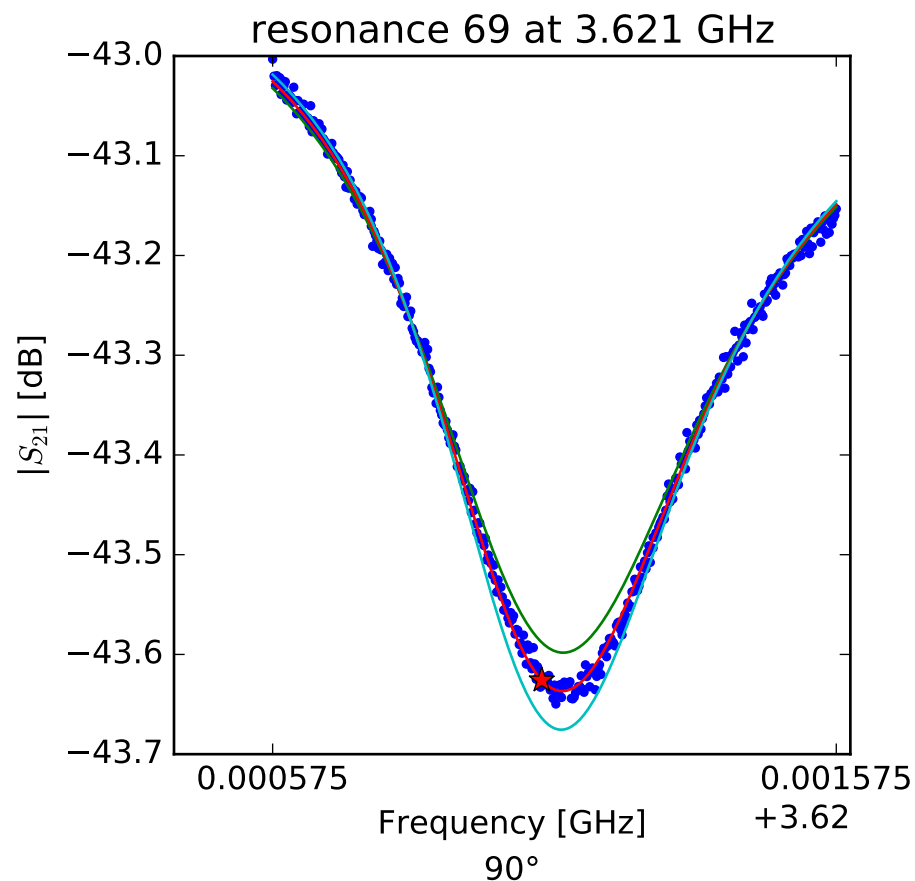
$$Q_r = 6215.09383389$$

$$Q_c = 609432.534602$$

$$a = (-0.00659624113154 + 0.00322039463748j)$$

$$\phi_0 = -0.49658811682$$

$$\tau = 39.8909740781$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.62105246217$$

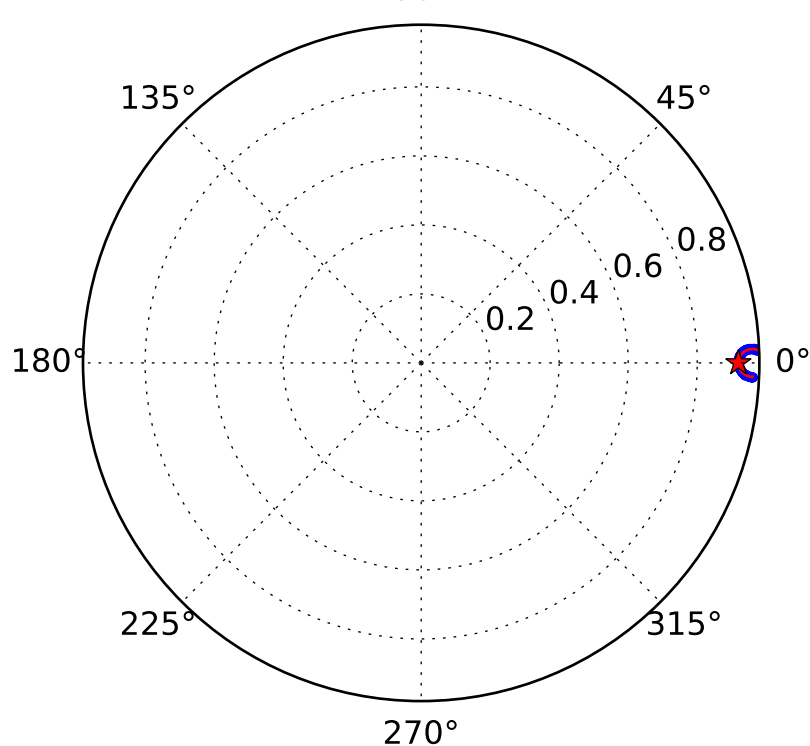
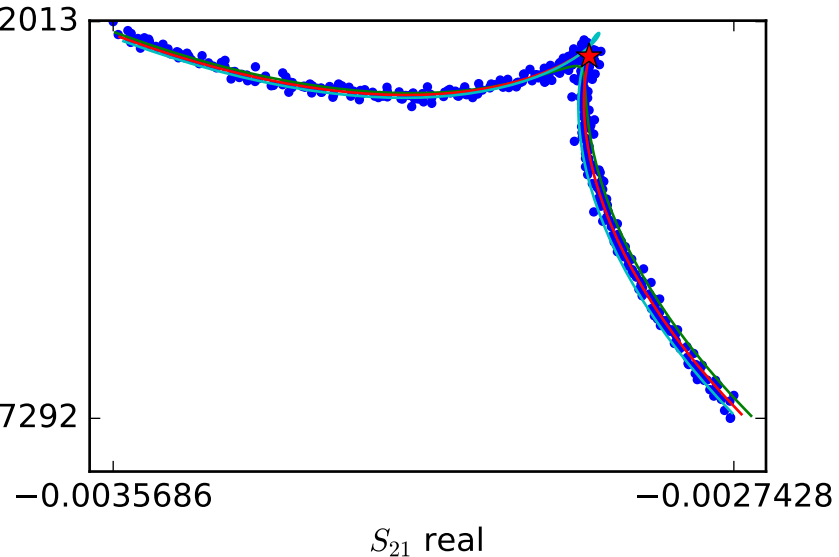
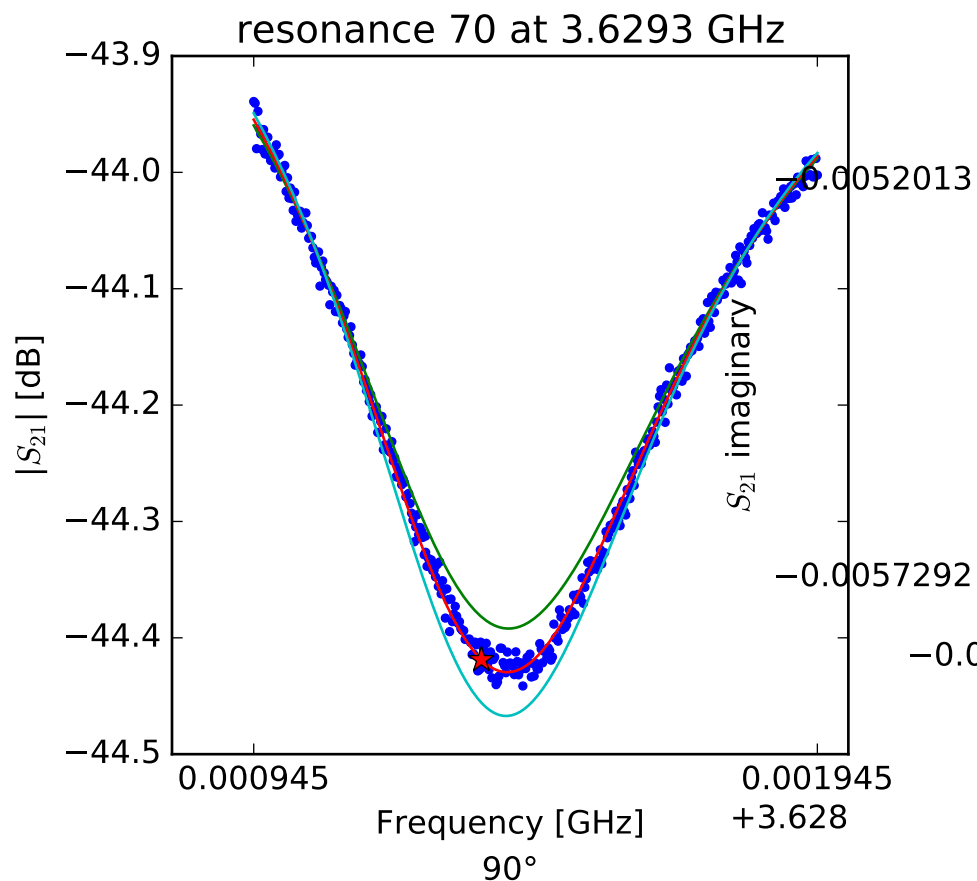
$$Q_r = 5837.42044614$$

$$Q_c = 70569.0417217$$

$$a = (-0.00571294692614 + 0.00432257559114j)$$

$$\phi_0 = 0.22282549128$$

$$\tau = 39.0525556844$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$f_r = 3.62934891438$$

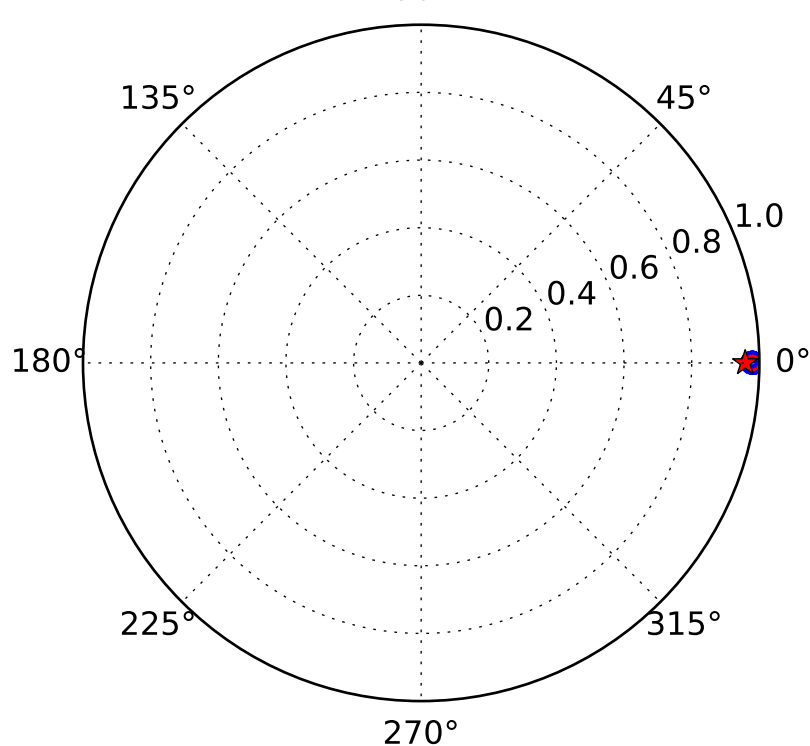
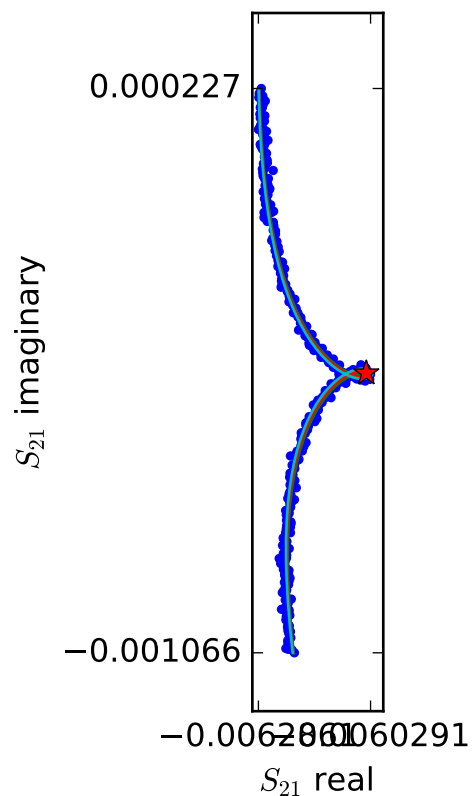
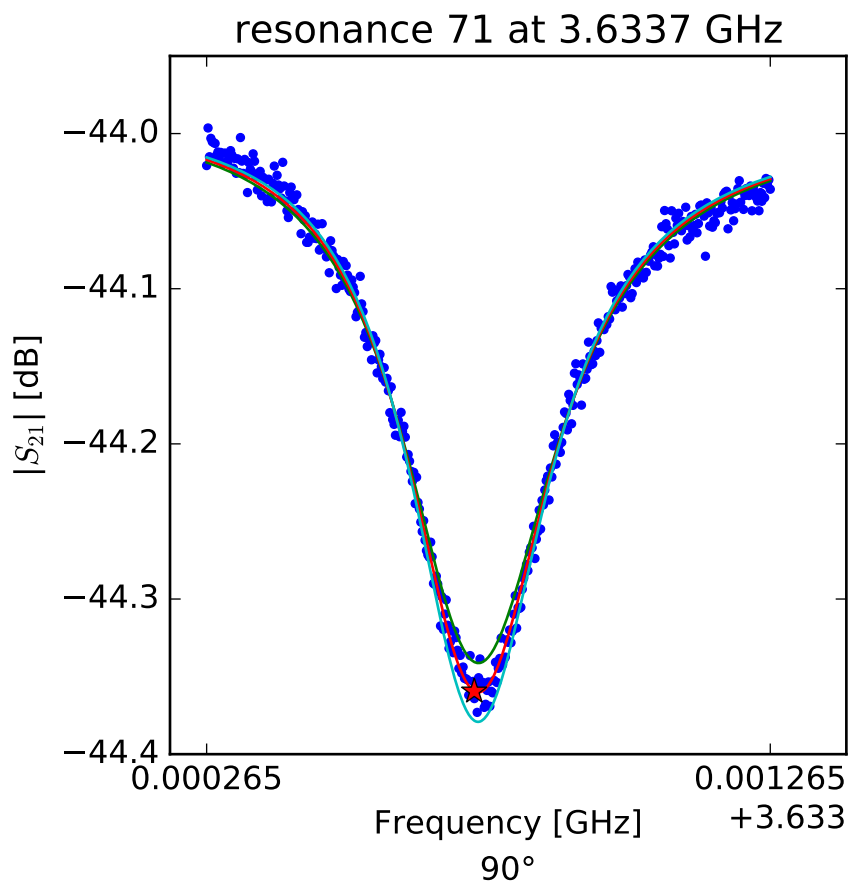
$$Q_r = 4640.12331396$$

$$Q_c = 57504.7845273$$

$$a = (0.00408335554836 - 0.00508910177964j)$$

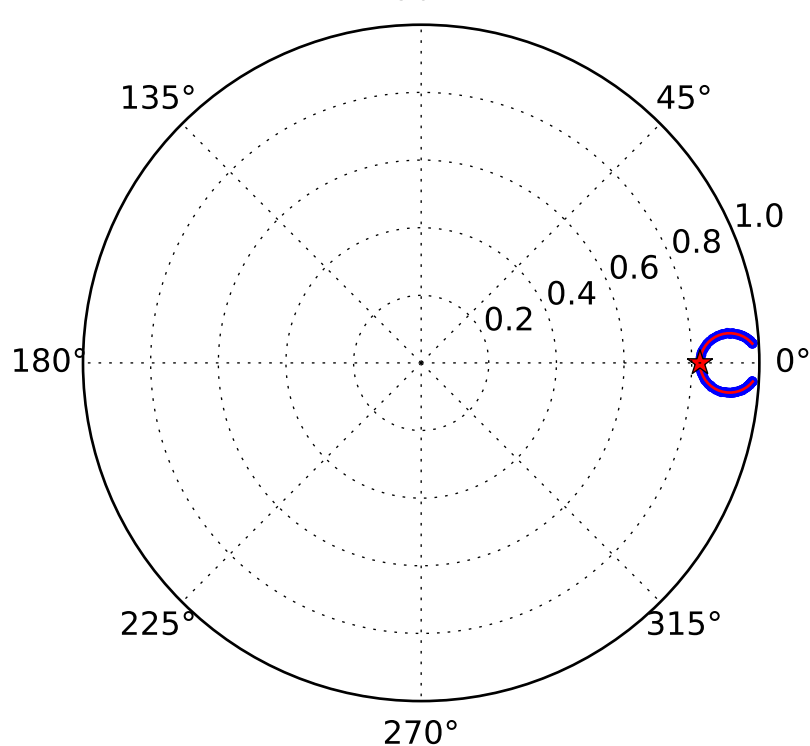
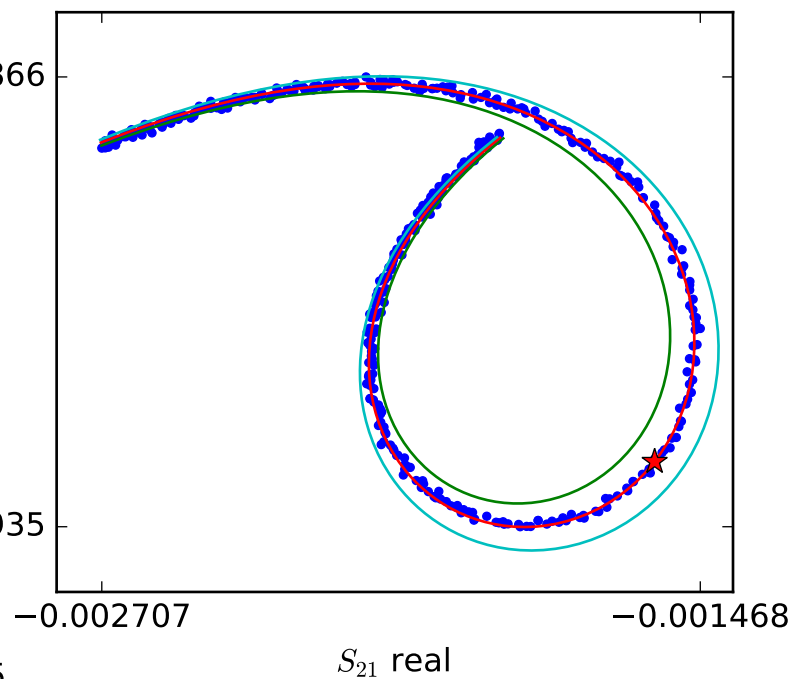
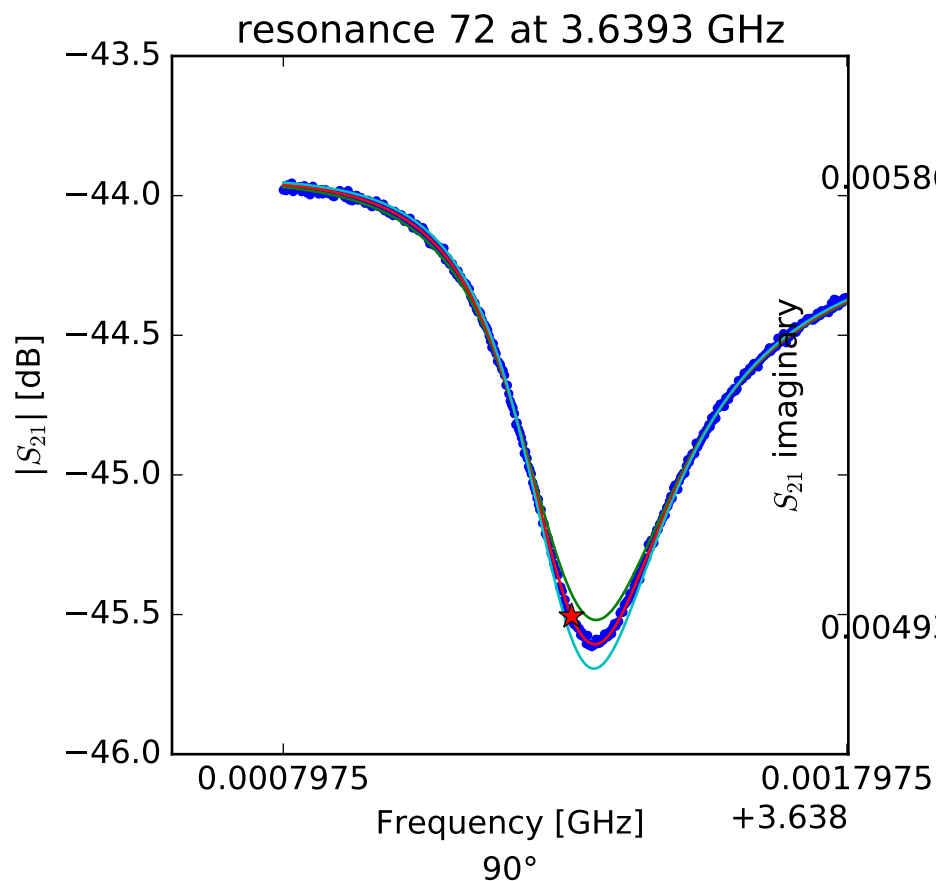
$$\phi_0 = 0.223934630438$$

$$\tau = 37.247919841$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.63373981104 \\ Q_r &= 11242.5609341 \\ Q_c &= 268576.135799 \\ a &= (-0.0053572232274 - 0.00334771552681j) \\ \phi_0 &= 0.0858826041257 \\ \tau &= 36.6226290156 \end{aligned}$$



$$S_{21}(f) = ae^{-2\pi jf\tau} \left[1 - \frac{Q_r/Q_c e^{j\phi_0}}{1 + 2jQ_r \left(\frac{f-f_r}{f_r} \right)} \right]$$

$$\begin{aligned} f_r &= 3.63930896922 \\ Q_r &= 10092.9757746 \\ Q_c &= 57454.244282 \\ a &= (-0.00605022097901 - 0.00175734831134j) \\ \phi_0 &= 0.412797199168 \\ \tau &= 36.3349423601 \end{aligned}$$