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plt.ylabel('Correlation', fontdict={'family':'serif','color':'black','size':10})
plt.title("Correlation Trend", fontdict ={'family':'serif','color':'black','size':12})
plt.legend(loc='upper left')
plt.show()

def plot_std(std_vec):
    x_vals = ["4", "5", "6", "7"]
    names = ["Xc", "Yc", "Zc", "w", "p", "k"]
    for i in range(len(names)):
        plt.plot(x_vals, std_vec[i], '-o', label=names[i])

    plt.xlabel("# of Observed Image Points", fontdict=
{'family':'serif','color':'black','size':10})
    plt.ylabel('Standard Deviation', fontdict={'family':'serif','color':'black','size':10})
    plt.title("Standard Deviation Trend", fontdict ={'family':'serif','color':'black','size':12})
    plt.legend(loc='upper left')
    plt.show()

if __name__=="__main__":
    # image 27
    x_27 = [-9.444, 18.919, 90.289, 18.174, 44.681, -7.578, 52.736]
    y_27 = [96.236, -81.819, -91.049, 109.538, 7.483, -49.077, -93.140]
    # image 28
    x_28 = [-105.378, -72.539, -1.405, -77.840, -48.786, -98.814, -38.924]
    y_28 = [98.756, -79.786, -86.941, 113.375, 10.165, -48.039, -90.035]
    # control points
    Xo = [-399.28, 475.55, 517.62, -466.39, 42.73, 321.09, 527.78]
    Yo = [-679.72, -538.18, -194.43, -542.31, -412.19, -667.45, -375.72]
    Zo = [1090.96, 1090.5, 1090.65, 1091.55, 1090.82, 1083.49, 1092]

    c = 153.358 # mm
    format_size = 228.6 # mm
    S = 5000
    sigma_obs = 6e-6
    corr_27 = []
    corr_28 = []

    std_27 = []
    std_28 = []
    for i in range(4):
        resection_27 = Resection(x_27[0:4+i], y_27[0:4+i], Xo[0:4+i], Yo[0:4+i], Zo[0:4+i], c, S,
format_size, sigma_obs)
        print('-'*80)
        print(f'Printing Report for Image 27, points 100, 104, 105, 200 - 20{i}\n')
        print('-'*80)
        resection_27.report()
        corr_27.append(resection_27.store_corr_mat())
        std_27.append(resection_27.store_std_dev())
        print('-'*80)

        resection_28 = Resection(x_28[0:4+i], y_28[0:4+i], Xo[0:4+i], Yo[0:4+i], Zo[0:4+i], c, S,
format_size, sigma_obs)
        print('-'*80)
        print(f'Printing Report for Image 28, points 100, 104, 105, 200 - 20{i}\n')
        print('-'*80)
        resection_28.report()
        corr_28.append(resection_28.store_corr_mat())

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